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REMOVAL OF RIGHT OR LEFT FRONTAL LOBES IN MAN*

BY

GEOFFREY JEFFERSON, M.S., F.R.C.S.

Neurological Surgeon, Manchester Royal Infirmary; Surgeon, National Hospital, Queen Square, London

In the early days of the neurological renaissance that followed the discovery of localized function in the cerebral hemispheres the frontal lobes seemed to select themselves as the seats of the intelligence by a process of exclusion. Once the motor, the sensory, the visual, the auditory, and the olfactory areas had been roughed out upon the cortex and the tracts coming to and from them plotted with gradually increasing certainty (a task to this day uncompleted), it was but natural that speculation should be busy with those large areas still remaining which were unresponsive to stimulation and often, but not always, curiously "silent" to destructive or disease processes in man.

Those of us who "teethed" in study twenty-five years ago did so on the cortical maps of Flechsig, Elliot Smith, Campbell, Brodmann, and the Vogts, and learned that the grey matter consisted of numerous areas with different developmental histories and with different histological structures. This was true not only of the projection areas but also of the various association areas, and it was demonstrable that the frontal lobes, like other parts, had not one single homogeneous structure, but were subdivisible again into several cantonments, the most posterior of which formed the motor cortex. The work of Ferrier, of Horsley, and of Sherrington in particular, allotted definite functions to the different parts of that latter area, though our knowledge even of the apparently simple motor cortex is not yet complete (see, for example, the revival of interest excited by J. F. Fulton (1932), then by F. M. R. Walshe (1935), and more recently by D. E. Denny-Brown).

The Problem of Frontal Lobe Function

Since some areas of the whole patterned cortex were known from the early days of the newer knowledge to possess specific functions—functions evidently related to structure—it seemed to be only a question of time, and of opportunity of the right kind, before these would be allotted in a similar manner to the so far silent remainder. The deduction that distinctive histological structure portended distinctive and discoverable activities was, and still is, an irresistible one. But it remains to make these areas reveal their local secrets. We have become so deeply impressed with the importance of local areas, especially the motor, that we are almost certain to assume that function is equally local in the silent localities and that a small lesion of a frontal lobe will be likely to produce an equivalent paralysis, in this case of the intellect or in emotional control. But there is in such a conception something of the absurdity that we recognize so clearly in the earliest work on the localisms of cerebral function, that of the phrenologists Gall and Spurzheim. Clinical observation has not succeeded in solving the problem of frontal lobe function, for whilst recognizable alterations of the expected kind are quite commonly present they are in some cases lacking. Moreover, paradoxical cases are met with in which there is intellectual deficit and a lesion is discovered at operation or necropsy in quite another part of the brain. The most useful evidence of the functions of the frontal lobes (since electrical stimulation has so far failed to yield anything informative) and the solution to some of these problems ought to come from cases in which one or both were removed in man. I have no personal knowledge of a bilateral removal, but reference will be made later to the only two cases which have been carefully studied and published.

Eight Case Histories

It is the purpose of this paper to present some examples of unilateral lobectomies, both left and right, and to set down as fairly as possible what the effects have been. There are eight cases in which one or the other frontal lobe was successfully removed. Two of these patients died subsequently, one of an intercurrent disease. Six are still alive, and, since three happen to be left-lobe removals and three right, they make an interesting group for comparison. The cases are of necessity described very briefly, and a great deal of negative evidence which might be demanded for scientific accuracy has been suppressed. It is hoped that at a later date some of these cases may be made the subject of closer psychological analysis by more competent hands than mine.

It is not my intention to enter into a long discussion of the symptomatology of frontal lobe tumours, for this is well enough illustrated by the cases themselves. It will be observed that the syndrome may vary with the type of lesion and a recognizable deficit be absent, so that fits and failing vision may be the only features to call attention to disease. Something will have to be said later about the reasons for the differences—why one case should show signs and others none; and especially we shall have to discuss the results of the operations.

Case 1

A female aged 22 was referred by the late Dr. Core to the Manchester Royal Infirmary, February 19, 1932. When seen in consultation the following note was made:

The patient sits propped up in bed and seems very cheerful and comfortable. She was pleasant and co-operative, but often slow in answering, though by no means always. She did not realize the seriousness of her state, and said she was very well. She declared that she had no headache at the time nor had she suffered from it. (This was untrue—she had suffered severely from headache and had had some bad crises; a few

* Based on a paper read before a joint meeting of Rochdale, Heywood, and Oldham Divisions of the British Medical Association on April 9, 1937.

days previously she had been really very ill with it.) Questioned on the onset of her illness she was very vague, but she knew how long she had been in the hospital, her full name, and where she lived. Often a striking point was the hesitation before she answered, as if she had not heard the question at all. She was not deaf. When the question was repeated she answered, but maybe after a brief pause. She spoke rapidiy enough, and never made a mistake in the arrangement of her words or use of nouns or verbs. Another obtrusive feature was her lack of volition. She spoke without vivacity with very few movements, and in a long conversation scarcely changed her posture once. She volunteered no remarks. She was completely apathetic about food, never asked for it or showed any interest when meal-times came round. Her ideation was evidently limited, for she was unable, as it were, to weave any patterns on ideas suggested to her. She thought that she had only been ill since her admission to hospital, but in this she was inconsistent, for soon she dated her illness as far back as November. (The actual date of onset, so her mother informed me, was the previous spring, and she had had to give up work because of headache and failing vision in October. She had been treated for indigestion because of vomiting, and had seen an eye specialist, who gave her glasses.) Her headache was frontal and not lateralized. She had had several attacks of twitching in her left hand. Two very brief attacks while she was unconscious had been observed in hospital, both occurring when her headache was fierce. It was thought that her right arm was drawn up close to the body, unconvulsed, in these attacks, and that the left side was quite silent. She was incontinent the rest of the day after these attacks, although quite conscious. It was interesting to observe her lack of interest in her incontinence. She forgot about it between-whiles, and when it happened passed it off as none of her business, or another time said that she voided before she realized what was happening.

Clinical examination revealed high-grade choked disks, relative anosmia in the right nostril, slight hypertonia on the left side, but no loss of motor power, no grasp reflex, left abdominals easily exhausted, equivocal left plantar reflex, flexor right. There were no radiographic abnormalities. The diagnosis was: right frontal tumour, probably a glioma.

Operation (March 2, 1932).—A right frontal osteoplastic flap was turned down. On opening the dura the cortex was pale and the gyri flattened. A high posterior puncture was made to tap the anterior horn of the right lateral ventricle but struck a gliomatous cyst at a depth of three centimetres. The cannula was at once withdrawn and the cortex incised down to the cyst wall after underrunning the cortical vessels with silk. The cyst was deep, and near the midline there was an obvious neoplastic lining. It was thought that the best way of dealing with it would be to excise the frontal lobe with the tumour inside it. The slightness of the pyramidal signs denoted that the posterior end of the tumour lay definitely in front of the motor cortex. The frontal lobe was thereupon excised, but the line of section ran into gliomatous tissue, and it was seen that the tumour was too extensive for complete extirpation. The invaded area was very thoroughly diathermized. The line of section ran obliquely upwards and backwards from the lesser wing of the sphenoid, but a thin shell of the frontal lobe was left behind mesially and inferiorly.

The effects of this excision on the patient were remarkable. It might have been thought, since she was already slow and apathetic through harbouring a tumour in the frontal lobe, that frontal lobectomy would have made her worse by removing still more normal and functioning brain tissue. Exactly the opposite happened. Next day she was extremely well, and whereas she had never before spoken unless addressed, and not always then, she now spoke readily and at first rather excitedly but sensibly. She was worried about her personal appearance, for her right eye was closed by a temporary oedema. The incontinence of both urine and faeces which had been so troublesome a feature stopped within twenty-four hours of the operation. There was no trace of contralateral palsy. She professed herself at the end of a week to be entirely well; she was able to give details as to where she worked and when she stopped work, as well as points in her earlier clinical history upon which she had before been very hazy. She moved about more readily in bed, and seemed to have an interest in life that had been lacking. She took her food well, and behaved very much as did the other patients in the ward.

The histological diagnosis in this case was astrocytoma with areas of malignant change. Probably the tumour should be regarded as a glioblastoma multiforme.

The patient was put on deep *x*-ray therapy and returned home. She remained to all intents and purposes normal for eight months, when she had a return of her previous symptoms and died fourteen months after her operation. As far as the frontal lobe removal was concerned the experience was encouraging, for it demonstrated that the mental disturbance associated with a frontal tumour could be relieved by lobectomy and not made worse, a very important point and one of which little was then known. It remained to apply the operation to a patient with a tumour not so far advanced as to transgress the limits of possible extirpation. No further opportunity arose until April, 1935.

Case 2

The next case can be very briefly reported because the patient died of an intercurrent disease seven weeks after operation. The case is useful only as a piece of evidence that the frontal lobectomy did not, so far as could be seen, seriously affect his mentality.

C. B., aged 44, was transferred on March 25, 1935, to the Neuro-Surgical Service from the medical wards of the Manchester Royal Infirmary by Dr. Fergus Ferguson with the diagnosis of right frontal tumour, probably astrocytoma. He had been admitted on account of his fourth series of severe convulsions, the first having been in 1928. In each of these series his fits had amounted to status epilepticus, but after a few days he had recovered completely and returned to his duties as a clerk almost at once. After the last series he had had much more headache, and had seemed rather slow in speaking and more drowsy than he should have been. Bilateral papilloedema was discovered, and the radiographs showed a calcifying tumour in the right frontal lobe, well forward. He had performed his duties perfectly well until the last outbreak of epileptic seizures that brought him into hospital.

On April 2, 1935, the voluminous right frontal lobe containing the tumour was removed, leaving the anterior fossa empty, the olfactory nerve being clearly seen in its floor; the falx was left bare on its anterior seven centimetres. The pericallosal vessels were exposed running round the genu of the corpus callosum. The mesial surface of the opposite frontal lobe was visible. The large cavity was filled with Ringer's solution and the flap replaced. The duration of the operation was five and a quarter hours. Next day the patient was relatively well and said he wanted to smoke. On the fourth postoperative day a conversation with him was taken down verbatim in shorthand. It was designed to test his memory, and disclosed no defects. He talked about his work, his children, and his home without difficulty He lay rather quietly and did not move about the bed much, but he spoke rather loudly, and his manner was a little aggressive, though perfectly friendly and good-humoured. He complained of coldness of the feet, but made little effort to stir his limbs, though he could do so freely when requested. This lack of initiative was perhaps significant. On the other hand, he said that he would like to get up and sit in a chair as a change. His mouth and teeth, which had been very dirty, remained so, owing to keeping his tongue and lips very still. He was not incontinent. He smoked incessantly when allowed, but gradually he became more normal and quiet in manner, and was discharged to the convalescent hospital a month after operation. Two weeks later he contracted facial erysipelas and died of pneumonia in Monsall Fever Hospital.

At necropsy the operation wound was seen to be perfectly healed. There was no intracranial infection. The truncated anterior end of the right hemisphere was covered by dura firmly adherent to the cut surface. Histological diagnosis: astrocytoma.

This case is robbed of its full value by the short survival of the patient. During the first days after his operation his state was not entirely normal, although he was in possession of his faculties so far as they could be tested. After that he steadily improved, but unfortunately a really detailed inquiry into his later condition was postponed, and then was prevented by his unexpected death. I should have been left uncertain about frontal lobe function if this had been the only case in my experience, but Case 1 had already been observed, and those that follow leave no doubt at all. In the remaining six cases the patients are all alive still, and in three at least the removal of the lesion has been so complete that their continued survival is certain. The three right lobectomies will be taken first, then the three left, though that is not their chronological order. Since the technical steps involved in these operations are very similar in all cases they will be but briefly referred to.

Case 3

Right frontal oligodendroglioma. Removal of right frontal lobe. Recovery.

Mrs. L., aged 35, was referred by Dr. Carleton of Bristol on September 13, 1935. Twelve months previously she had commenced with intermittent attacks of headache and vomiting which were thought at first to be "bilious." In addition there were attacks of dizziness, during one of which she fell and hurt herself, and had to remain in bed for a week. Whilst recumbent she had another bad vertiginous episode. She vomited severely in all of these attacks. For the last few months she was no longer sick, but had headaches of great severity at intervals of about one month, commencing usually about 2 a.m. and lasting for one or two days. The pain was all over the head, but chiefly on the right side and at the back, with some stiffness of the neck. During these acute spasms of pain it seemed to relieve her if she could hold someone's hands and dig her nails into their palms; whilst doing this she stood with bent head, her face flushed, perspiring visibly, and breathing rapidly. On this account the case was for long regarded as one of migraine with a hysterical overlay. Latterly she had become touchy and irritable. Her memory was said to be bad, but very few useful illustrations of this were forthcoming. If she went to the cinema she could not remember when she got home what the film had been about (this struck her friends as remarkable). Vaguely, also, she felt that she could not concentrate. She consulted Dr. Carleton, who found bilateral papilloedema and an extensor left plantar response. She was referred to me. Acuity was normal and the fields were full; no other signs were elicited other than those recorded by Dr. Carleton: no anosmia, no hypertonus, no grasp reflexes. Stereoscopic radiographs by Dr. Twining brought to light scattered calcification low down in the right frontal lobe. Diagnosis: right frontal glioma, probably oligodendroglioma.

Her hypertensive attacks were peculiar and suggested a third ventricle tumour until the radiographs cleared the issue. She was bright and quite alert, except during or after her violent attacks of pain, but her husband was aware of an indefinable change in her. She was admitted to a nursing home, and on September 29, 1935, the right frontal lobe was removed. The line of section passed through the frontal horn of the lateral ventricle. The mesial surface of the left frontal lobe seemed to be superficially invaded by the tumour and the posterior line of section was not above suspicion. After a blood transfusion the wound was closed. She made an uninterrupted recovery. Forty-eight hours after the operation she was reading the newspaper and carried on a normal conversation with me. Her conversations were recorded verbatim, and they showed no defect whatever. She has been having deep *x*-ray therapy since, and has been seen from time to time.

Re-examined in March, 1937, eighteen months after operation, she says she is as well as ever in her life, and her husband privately agrees with this. Her memory, concentration, and demeanour are all normal. She does a great deal of housework, cooking and so forth, reads, sews, and listens to the wireless. All the frontal lobe signs which she had until her frontal lobe was removed have gone. I have interviewed the husband as well as the patient more than once, and have tried to get him to allow that something was amiss, but he will never admit to anything at all. She always had been a friendly sort of person, and he is sure she is not more so now; she was naturally good-tempered, but apt to lose her temper and regain it very quickly. These traits have not been modified. Histological diagnosis: oligodendroglioma.

Case 4

Mrs. E., aged 45, was admitted to the National Hospital, Queen Square, under Dr. Purdon Martin, on February 14, 1936.

Three years previously she had consulted an optician because her eyesight was failing. Four years ago she had begun to suffer from generalized headache, which sometimes wakened her in the night. Sudden jarring or sneezing greatly aggravated the headache, which was intermittent and, though not becoming more severe, was becoming more frequent. Eight months previously she discovered that her right eye was blind. Whilst in hospital in Southampton, a month before admission to the National Hospital, she had a convulsive seizure in the night about which she knew nothing. On examination there was primary atrophy of the right optic nerve, and two dioptres swelling of the left. Apart from diminution of the sense of smell in the right nostril there were no other neurological signs. Radiographs showed a localized hyperostosis over the right optic canal—an important point, the significance of which has been commented upon elsewhere (Jefferson, 1936). There were no mental and character changes, and she was perfectly orientated in time and place. She was operated upon by me on March 12, 1936. A right frontal osteoplastic flap was turned down and a large basal meningioma removed. The right frontal lobe had to be excised in order to get proper access. The operation was arduous, the duration being five and a half hours. Apart from pyrexia during the first week convalescence was smooth. Owing to this patient living at a distance contact has had to be maintained by letter. In March, 1936, she stated that she was better than she had been for years and had no disability, mental or physical, whatever, except for the blindness of her right eye. She works as a housekeeper.

The next case is too recent for any final assessment, but since it illustrates well the disappearance or at least amelioration of frontal lobe signs following removal of the lobe it is worthy of inclusion.

Case 5

Mrs. H., aged 49, was admitted to the National Hospital, Queen Square, under Dr. C. P. Symonds, on January 7, 1937. Her history as given by herself was unreliable and needed correction by her husband on many points.

Two or three years ago she began to suffer from occasional headaches and from peculiar fainting attacks in which she did not quite lose consciousness (minor epilepsy). Four months previously her husband returned home and found her in a peculiar dazed state. She was confused and unable to give any account of what had happened. She had vomited. She recovered in a few hours, and then had no recollection whatever of the incident. From that time her headache increased in severity, and was at times, especially during the night, almost unbearable for half an hour. She became very confused during the worst headaches. She tried to do her housework, but was incapable of either initiating or completing the simplest

task. She began to show definite forgetfulness and mental deterioration. She was well aware of the undependability of her memory, and would ask her friends not to tell her things, as she would be certain to forget them. On admission, questioned about an abdominal scar, she said she had had her appendix removed a good many years before. She did not know when or where. Pressed for an explanation, she said that she had not had an operation after all. She was a well-nourished healthy woman with a mild dementia. She could not remember the name of the present King. She resented physical examination in a playful, shallow way. There was bilatertal papilloedema and no pyramidal signs. Radiographs disclosed a linear calcification in the right frontal lobe. Diagnosis: right frontal astrocytoma.

On February 11, 1937, the right frontal lobe was removed, the line of section running upwards and backwards from the lesser wing of the sphenoid and cutting through the lateral ventricle. There was no great alteration in cortical pattern, but puncture disclosed a tumour at a depth of three centimetres. On taking several readings it was found to come closest to the lower surface. There was no sign of tumour breaking through the mesial surface, as is so common in apparently unilateral frontal tumours, so a complete excision was carried out. There was a suspicious area to the inner side of the ventricle, seen after it had been cut across. The duration of the operation was two and a quarter hours. A month later this patient was greatly improved. Prior to the operation she was an aimless sort of being. The ward sister reported that she would sit for hours with a plate of food and not finish it, or if she went to the bath would have sat in it all day if she had not been got out (suggesting Flourens's decerebrate chickens). After removal of her frontal lobe she gave a different impression, seeming to have a purpose—to know what to do and to get on with it. In conversation she seemed nearly normal, and lost her facetious manner. She was never incontinent after her operation, though previously she had occasionally been so. There was a slight left-sided facial weakness for a time afterwards, but no weakness in the arm or leg, and there was no grasp weakness.

I am unwilling to accept this patient as entirely free from signs at the time of writing. Her powers of memory are not yet all they should be, but her alteration for the better is striking. She was up and about the ward at the end of two weeks. Her husband has written to say that she is normal mentally, and in reply to a detailed questionary he reports her, on all points, as having no abnormalities. But in June she had a convulsion and lost ground afterwards. Her future is uncertain, not because of the lobectomy but because of the likelihood of recurrence.

Removal of Left Frontal Lobe

The remaining three cases had the left frontal lobe removed; they also are presented in chronological order.

Case 6

Mrs. W., aged 32, was admitted to the National Hospital, under Dr. C. P. Symonds, complaining of blindness in the left eye, failing vision in the right, anosmia, severe headache, and "fainting turns."

The diagnosis of left frontal basal meningioma was made and, since she did not desire to run the risks of tumour removal at that time, a right-sided subtemporal decompression was performed. She was readmitted on March 19, 1936, because her fainting attacks were becoming more frequent and for a month past her headaches had returned. She also thought the sight of the right eye was declining again. The decompression had meanwhile varied, sometimes tight, sometimes slack, but always bulging to some extent. Neurological signs were as before: left optic atrophy, blind left eye; right papilloedema. field normal save for enlargement of the blind spot. She had anosmia, and protein increased in the cerebro-spinal fluid to 200 mg. On April 30, 1936, a left frontal osteoplastic flap was turned down and a small meningioma was found growing from the falx. The superior longitudinal sinus and a section of the falx were removed, whereupon a second, much larger, meningioma was seen arising from the olfactory groove. The left frontal lobe was resected to give access to this tumour, which was removed in its entirety and its point of origin heavily endothermized. The duration of operation was five hours and forty minutes. One blood transfusion was given after four hours.

One hour after the close of the operation the patient spoke to the operator and said that she felt all right but was afraid of the ordeal which she thought she still had to undergo. Her convalescence was uneventful; at no time did she show any evidences of mental disturbance. She has been re-examined at intervals during the past eleven months, and was shown at the clinical meeting of the Neurological Section of the Royal Society of Medicine in February, 1937.

She does all the housework, shopping, and mending. She declares herself to be entirely normal in every way. She is never at a loss for a word; indeed, it was suggested that she was a trifle facile verbally. This patient has been in hospital for two long stretches, and great interest has been shown in her. She is naturally a friendly

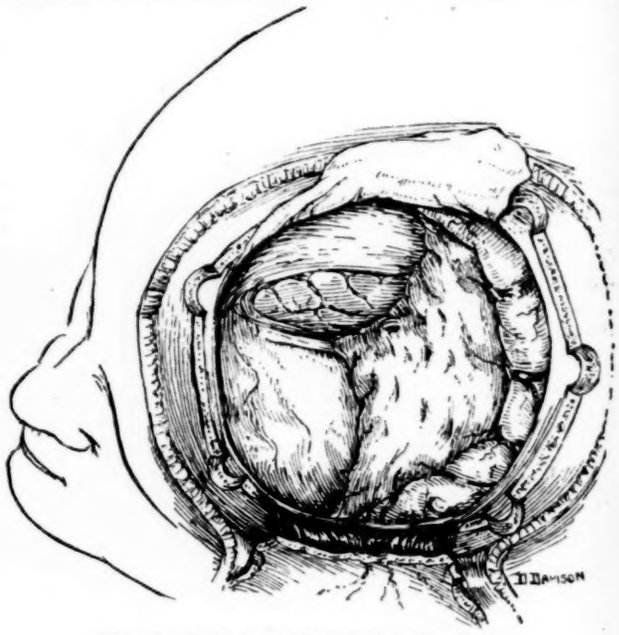

FIG. 1.—Left frontal lobe, subtotal removal.

person, and I am not convinced that her demeanour is different from that of any other individual who has had the same comparable experience in a special environment. Her pursuits at home are those normal to her social class: she reads the papers, goes to the cinema, listens to the wireless, and so forth. She has no difficulty in writing. She does not need to make shopping lists because she remembers all she wants. She has no difficulty with prices or money, and easily knows what change should be given her after her purchases. She is neither especially good-tempered nor especially bad-tempered. Possibly she is a little lacking in reserve, but, if so, this is scarcely noticeable. Views on that point will differ with the amount of deference that the observer expects, but patients of course are very variable in that respect.

Case 7

Mrs. B., aged 39, was referred on October 9, 1936, to the Neuro-Surgical Service of the Manchester Royal Infirmary by Dr. Leslie Cunningham of Liverpool with the diagnosis of left frontal tumour.

She had had headaches for over four years, usually left frontal. Two years ago she had an epileptic seizure, and she had had three since. They were severe, generalized, with unconsciousness for two or three hours. Nine months prior to admission she found that she was blind in the left eye, and for six months she had had anosmia. During the last year her memory had seemed to go, so that she found it very difficult to give a proper account of her illness. She thought that she did not always understand what was said to her, that she failed to catch the meaning, so that sometimes she did not do things asked of her or reply in a sensible manner. She had good insight into this failure on her part (as was so in Case 5), and it worried her. She was co-operative, but was inclined to facetiousness. She was not taking a gloomy view of her condition, but when this was mentioned to her she replied that she found little to be cheerful about. She knew that at times she was extremely irritable and difficult. She was much less active than formerly, and was inclined to sit about, but this she attributed to her bad eyesight and her headaches. On examination no grasp reflex was present and she was blind in the left eye. Bilateral consecutive optic atrophy was present with papilloedema. This and the anosmia were the only positive signs. Diagnosis had already been arrived at by Dr. Cunningham by means of thorotrast ventriculograms, which showed the anterior horns of the ventricles displaced to the right. Radiographs of the skull showed a normal sella and a large abnormal diploic vein on the left side in the parietal area which could not be directly related to the tumour. The pre-operative diagnosis was an olfactory groove, at least an anterior fossa basal, meningioma. Perhaps sufficient weight had not been given to the fact that she had only noticed her anosmia recently, quite three years after the onset of her troubles. On October 24, 1936, a left frontal flap was turned down. On opening the dura a dark, reddish-blue, voluminous glioma was seen occupying the left frontal lobe. It was adherent to the dura anteriorly and to the falx mesially. The superior longitudinal sinus and falx were resected for a distance of six centimetres in order to allow of block removal of the frontal lobe with its contained tumour.

The operation proved to be long and tedious; 600 c.cm. of blood followed by 500 c.cm. of glucose-gum solution were given at the end of two and a half hours, and at the close, an hour later, a further 600 c.cm. of blood. The tumour-infiltrated lobe was soft, very vascular, and difficult to handle, its adhesion to the dura being exceptionally dense. The right hemisphere was not invaded. Such areas of dura as were not easily removable and showed evidences of invasion were heavily coagulated with the endothermy unit. The line of section was clear except deep in and mesially, where the tumour changed colour and became pale. Perhaps this region represented an area of astrocytic reaction.

The patient's recovery was smooth. Except for extreme thirst she said she felt well enough. On the tenth day she became very excited and noisy, declaring that her children were outside the ward and were being prevented from seeing her. She was at that time quite out of contact and would not listen to reassurances or react to persuasion. She quieted with chloral and bromide, and next day was better. Three days later she apologized for the trouble she had given. She remembered the incident perfectly, and said that she had been mistaken in the date, believing it to have been the regular midweek visiting day. Her memory was better, and with the disappearance of her headache and slight improvement of her vision she became very much more normal. The tumour was found to be an oligodendroglioma.

The patient was re-examined on April 17, 1937, six months after the operation. She said that her memory was now remarkably good, and she gave a lot of details about her earlier history that she could not give before. For example, she told of an unreasonable outburst that she had shown seven years ago, which makes the history much longer than she had led us to believe. Except for a slight freedom of manner which was in no way unpleasant she appeared to be quite normal.

Case 8

Mr. L., aged 42, was admitted to the National Hospital, Queen Square, under Dr. Purdon Martin.

For five years he had suffered from attacks of minor epilepsy which he found difficult to describe; these were of short duration. Three years ago he had a major fit and was unconscious for half an hour. Two years ago he began to suffer from a frequent dull pain in the left forehead and around the left eye. For eighteen months his memory had been somewhat impaired for some recent things, whilst remaining good for older events. He is a cabinet-maker in his father's firm, and sometimes made mistakes in his measurements and forgot names. For nine months he had had visual impairment, the print going blurred on reading. On examination he was found to be a well-looking spare man, very slow in his reactions but well-mannered and very co-operative. There was anosmia on the right, none on the left (a paradox as it turned out). There was early papilloedema on the left, the right fundus being normal; fields were normal. There were no other positive neurological signs. Radiographs of the skull disclosed a series of confluent calcified rings low on the left frontal lobe, the inner edge just crossing the midline, no doubt below the falx. No such picture had been seen before, and it was suggested they might be calcified hydatid cysts. Whatever the lesion, it was clearly well delimited and benign, whilst it was equally certain that it was the cause of his complaints over the last five years or even longer (two undiagnosed illnesses in which he was unconscious for a varying number of days at long intervals, the first thirty-five years ago, have been omitted). The cerebrospinal fluid protein was 75 mg.

On December 23, 1936, the left frontal lobe was removed after the calcified mass had been enucleated from its interior. When the dura was opened there was seen to be marked atrophy of the anterior frontal convolutions, which were stained a dirty yellow colour. The convolutions felt very firm, and on puncture the calcified tumour could be reached at a depth of 1.5 cm. The main mass was mesial in position, so the veins entering the superior longitudinal sinus were coagulated to allow of inspection of the inner surface of the hemisphere. The tumour was then seen, and was shelled out of the left frontal lobe by dissection with wet pledgets of lintine. It had to be followed across the midline and the inferior longitudinal sinus and free edge of the falx divided to allow of its delivery from the opposite side. The anterior cerebral artery was closely adherent to the tumour and had to be cut; it gave some trouble before it was secured with silver clips. After removal of the tumour mass the shell of the left lobe which remained was seen to be so blue that it was thought wise to resect it. The operator already had had experience of two left-lobe removals to encourage him to do this. Moreover, the left anterior cerebral artery had been clipped near its origin, so that the lobe would be not only useless functionally but a likely source of trouble during convalescence. The left olfactory nerve was seen lying in the floor of the anterior fossa untouched by the tumour. The duration of the operation was two hours and twenty-five minutes.

The patient spoke at the end of an hour after the operation and gave his full name correctly. However, next day he was moderately aphasic, and during the next three days became disorientated, though his speech was better. He was incontinent. A week after the operation his incontinence had disappeared, his speech had returned to normal, and he was much clearer mentally. He made a steady recovery.

Two months after the operation he travelled down from Northampton by himself and went on to Bournemouth to a convalescent home. There he played cards with the other patients and took part in the ordinary routine. He was shown at the clinical meeting of the Neurological Section of the Royal Society of Medicine, February, 1937. He declared then that he was quite himself again; indeed, better and clearer-headed than he had been for some years. He was still slow in his manner and diffident, but he is that sort of person. A word should be added on the subject of his aphasia. He

was the only one of three cases of left lobectomy to show aphasia post-operatively, though it was of very short duration. The posterior end of the cyst-agglomerate extended well backwards behind the level of the lesser wing of the sphenoid and must have compressed the subcortical pathways well back. The disturbance was purely of "nervous shock" or diaschisis from oedema, for he recovered his speech in four days. This patient wrote to the hospital in April specially to thank everyone concerned, because he felt better than he had ever done before.

Amount of Cerebral Tissue Removed

The anatomical frontal lobe is the largest of all. It extends from the frontal pole to the fissure of Rolando, and includes the pre-frontal, frontal, and motor areas. No surgeon would remove the whole lobe, and in the cases described the frontal association "area" rather than the frontal "lobe" has been extirpated (see Figs. 2 and 3).

The lines of section have always had the same starting-point below, immediately anterior to the Sylvian point and the lesser wing of the sphenoid in order to avoid the middle cerebral artery and the insula. The incision has been carried from there up to the midline either straight or curving a little backwards. The areas of brain removed correspond to Brodmann's areas 8, 9, 10, 11, 45, 46, and 47. Area 8 has probably not been entirely removed in any of them (see Fig. 4). None of the cases had purely anterior polar removals. Of course it may be that with neoplasms the normal brain tissue has been pushed backwards to some extent so that the line of section is actually further forward than it seems to be. The surgeon can only record the state as he sees it at the time. More functioning cortex is removed with the gliomas than when the compressed brain tissue over a meningioma is taken away, so that the amount extirpated was probably least in Cases 4, 6, and 8. As for the actual technique, a lobectomy is by no means a difficult operation, and is often a preliminary to much more difficult procedures. The times taken over the various operations have been recorded, but they are only of passing interest. Some of the operations might well have been more expeditiously performed at the present time, though three were so difficult technically that saving time by cutting corners would have led to disaster.

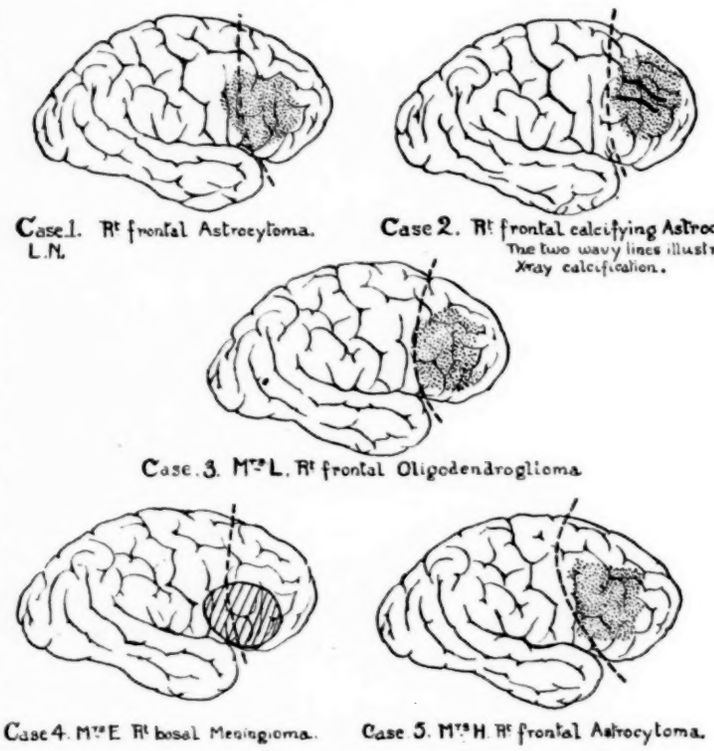
Case 1. Rt frontal Astrocytoma. L.N.
Case 2. Rt frontal calcifying Astrocytoma. The two wavy lines illustrate X-ray calcification.
Case 3. Mrs L. Rt frontal Oligodendroglioma
Case 4. Mrs E. Rt basal Meningioma.
Case 5. Mrs H. Rt frontal Astrocytoma.

FIG. 2.—(Five cases).

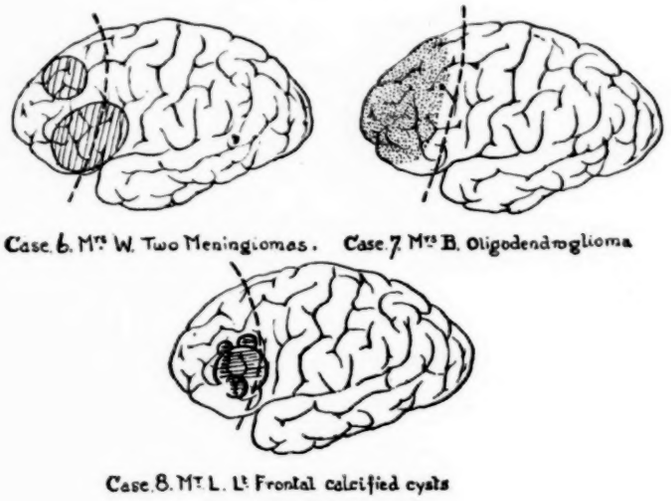

FIG. 3.—(Three cases).

Previously Recorded Cases

One of the earliest cases to focus attention on frontal lobe function was the famous "American crow-bar case" in 1848, which concerned a New England farm labourer, Phineas Gage by name. He was a popular hard-working man until his accident, in which a crow-bar 1½ inches thick was driven by a gunpowder explosion completely through his head to fall on the rock near him. He was not unconscious, and walked away with assistance from the scene of the accident. After a severe infection which must have increased the cerebral injury he recovered so far as to be able to work at different places for twelve years, dying then in convulsions. Meanwhile he had had the foresight to sell his skull to several universities. It lies now in the Warren Museum at Harvard. Phineas Gage was converted into a childish kind of crook (as Harvey Cushing has expressed it), was profane, obstinate, and given to outbursts of temper.

In view of the much more benign results of the frontal extirpations in the present series I have been at some pains to review this case. The crow-bar passed through the rostral end of the left temporal lobe, the left frontal lobe, the falx and superior longitudinal sinus, and the mesial surface of the right frontal lobe (see both Harlow's (1869) and Bigelow's (1850) descriptions and the skull itself). Such an extensive lesion is more in keeping with what follows and what has gone before than a sharply localized unilateral lesion would have been. However,

evidence drawn purely from traumatic material is apt to be fallacious, as we see next in Phelps's assertion (1897) that mental changes nearly always follow an injury of the left frontal lobe, rarely one of the right. In more recent times frontal lobe function has been studied by many writers. Grainger Stewart (1906) from his clinical observations denied the dominance of the left frontal lobe, and stated that mental changes were much commoner with bilateral frontal, and especially callosal, lesions than with those of one lobe alone. The present series

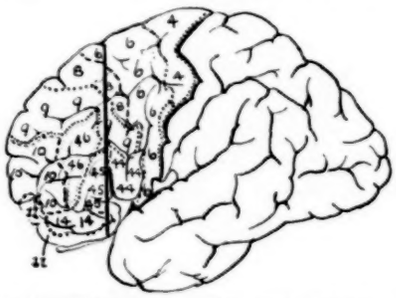

FIG. 4.—Diagram of frontal areas, Brodmann.

confirms that view. Animal experiments from the days of Goltz (1879) to Bianchi (1922), and on to Lashley, Franz, and Fulton and Jacobsen, have all pointed in varying degree in one direction—that unilateral removal of areas corresponding to those removed in my own cases led to no discoverable loss, whilst bilateral ablations did so (Fulton and Jacobsen, 1935). These two authors' ability to produce an "experimental hysteria" in anthropoids by giving them problems that were increasingly difficult to solve, and their inability to produce it after both frontal association areas had been removed because the animals were too easy-going to bother themselves when they failed, was an interesting side-light on the part played by these zones. It seems to be quite certain in experimental field work that anthropoids which have been largely trained beforehand are still quite able, after a single (either) frontal lobe has been taken out, to resume and solve the problems that they have learned, and even to add new ones to their repertory. Section of the corpus callosum on anthropoids has little or no untoward effect (Kennard and Walter, 1934), but clean section is quite another matter from callosal gliomas, which damage the lobes on the two sides.

Turning now to observations on removal of these frontal association areas in man, Dandy in 1922 described the operation of unilateral frontal lobectomy, and reaffirmed it in 1928 as a harmless procedure. He has not published analyses of the mental status of his cases, and detailed reports from whatever source are rare in the literature. In 1935 Penfield and Evans recorded three cases in detail, a fourth very briefly. One was of great validity, because the operator had known the patient intimately for forty years. All these patients showed surprisingly little deficiency after the operation; one was bad at mental arithmetic (but it may be doubted how far this can be widely applied as a psychological test), and one patient, the best-known case, was a little lacking in initiative, though able to do her housework and look after her family. In this patient, however, some growing tumour had been perforce left behind at operation, and she died subsequently of recurrence. German and Fox (1934) reported three cases with results much the same as Penfield's. Glen Spurling (1934) removed the right frontal lobe in the attack on an olfactory groove meningioma which crossed the midline, operating twice from the right side. Not only was the right frontal lobe removed, but the left was reduced to a fringe by the compression of the tumour. The actual degree of left-lobe destruction cannot be accurately estimated (see comment above on brain compression by non-invasive tumours). Spurling's patient made an excellent recovery, and psychometric tests by S. Ackerly (1935) showed her to be eventually near normal.

So much for unilateral and partial bilateral extirpations. One case only is on record in which both left and right frontal lobes have been excised in man—Brickner's case (1936). This is unique in the completeness of the post-operative analysis, only made possible by special circumstances. The record, though most instructive and exceedingly important, makes depressing reading, and no one surely will remove both frontal lobes widely again. A few remarks must be made about this case. A year and onwards after the operation he became a boastful, joking individual, with at the same time a certain amount of both voluntary inhibition, control, and synthesis of ideas. But in general he behaved like a child given to outbursts of naughtiness and difficulty, in which a sexual element was sometimes, but not always, present. Brickner states that his powers of evasion, when cornered on some point in argument, were little short of masterly. Studying this case, not alone in terms of brain removed but in the Jacksonian way, we come upon the question, With what parts of his brain were those jokes, those excuses, those mental side-slips, elaborated? Clearly with the more posterior portions of his brain. And Brickner, after exhaustive tests, concluded that there was no specific function in the frontal lobes which was not present in some degree elsewhere.

Discussion

Two points of great interest arise out of my own cases: first, that those who showed no mental alteration before the operation were unaffected by partial removal of the anatomical frontal lobe; secondly, that those who had mental symptoms were much better after the lobe had been excised. It can be concluded that removal of one frontal association area has left these patients with sufficient volume of neural tissue to ensure their being able to carry on their lives unaided afterwards (unless vision has been too badly interfered with by papilloedema beforehand). It appears to be quantity, volume, that matters most, even in man and not alone in the lower animals, as Lashley's work had suggested. No one will deny that the frontal lobes are deeply concerned in intellectual processes and emotional control, but they are not the only parts of the cerebral mass involved in these activities. It is clear that in a single frontal lobe mental activities have no closely packed, essential, or solitary locus the withdrawal of which leads to a state of dementia, partial or complete, and that the brain must function intellectually and emotionally as a whole, in the sense of Hughlings Jackson rather than in the departmental way that anatomical research once suggested. The frontal lobes cannot be regarded, either singly or together, as the "organ of mind." Pavlov proved the cortex to be a mosaic of function in which nothing was fixed except the motor and various sensory areas; it was a kaleidoscope of infinite possibilities of inhibition, adaptation, or substitution in mental and emotional processes. So that it can be concluded, from my own cases and those of others, that the reason why we have not known the exact localization of the higher cerebral functions is because they are not localized to any one small area.

Left-sided Dominance.—Many have thought the left frontal lobe to be more important than the right, and that

whilst right-sided lesions produced no great change left-sided ones did so. The evidence in favour of this is very tenuous, and my own cases go directly against such a view, for the patients were equally little affected, whichever side was operated upon. It must be conceded that once a lesion on the left side begins to go back behind the limit of the association area on the left there is a likelihood of damage to the speech centres, and no doubt it is on this account that the doctrine of left frontal dominance has grown up. An analysis of clinical material by Hyland and Botterell (1937) shows no essential difference between the two lobes apart from the aphasic element, and their conclusions on frontal lobe activities appear to be similar to those expressed here.

Cause of "Frontal" Changes

If a patient, one of whose frontal areas has been removed, has no severe frontal signs afterwards, it can be assumed that it was not purely one-sided frontal damage which was the cause of his previous disabilities. This is a very important point, but it seems to be established. In searching for another explanation two suggest themselves. The first is that it is the rise in general intracranial pressure occasioned by the tumour which is the additional agent that adds volume to the local lesion by producing widespread cerebral anaemia or oedema and interferes with the irradiation of impulses, compensation, inhibition, and so forth. Many cases are on record in which mental confusion has disappeared after a plain decompression without removal of a tumour. It must be that the successful operative management of such cases, with the consequent fall in intracranial tension and better cortical vascular irrigation, allows a resumption of normal powers by the uninjured parts of the brain. Conversely, frontal signs often appear in a high-pressure case even when the tumour is not frontal in situation. Gordon Holmes (1931) has expressed the opinion that mental symptoms are often due to high pressure irrespective of the site of the lesion. This is unquestionably true, and there is little doubt that many ill patients are psychologically abnormal not only because their suffering alters their reactions, but because their cerebral functions are impaired by anaemia. High pressure alone disturbs the mental activities of a patient more than does a local frontal tumour, because it interferes with the brain more widely than the tumour itself does; on the basis of Pavlov's view of cortical function in an integrated manner this can occasion no surprise. However, in the present series, in two cases the pressure was high and the patient had a frontal tumour as well, yet frontal signs were at a minimum. It is noteworthy that in both of these the tumour was non-invasive. This brings up the second possible factor already foreshadowed, the possibility of the tumour itself inducing some of the changes. We know that tumours which involve the primary receptor or effector apparatus often stimulate those areas to produce Jacksonian, motor or visual, or very often olfactory fits. Something of the same kind may occur in the frontal lobes; there may be some excitatory factor at the nature of which we can at the moment only guess. Such an idea was put forward long ago by Dupré and Devaux, who believed that the tumour exerts a toxic influence; but there is no clear evidence of it, and I, along with A. D. Macdonald, have failed so far to find histamine in gliomas in a few trials. I believe that the general circulatory basis plays a considerable part in the production of mental and emotional changes, but I am impressed by the differences shown by patients with invasive and non-invasive lesions. It should follow that "frontal" changes will be most pronounced when the lesion is bilateral (as in callosal tumours), or when it is invasive, or when pressure is high, or in combinations of these conditions. Moreover, it is now easier to understand the delirium of toxic conditions, general and local, and suggest new ideas in the interpretation of the various states arising out of head injuries.

It would be unwise to conclude that removal of a frontal association area will always be a benign procedure. The patients in this series were not of any considerable mental stature: their occupations were not such as would easily bring to light faults in the higher synthesis of ideas. Whilst, therefore, a considerable amount of caution must be exercised in drawing conclusions from them which would tend to the formulation of a dogma, they illustrate the more plastic conception of cortical activities current to-day. In none was the operation carried out except in the face of necessity.

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ENURESIS*

BY

ROBERT HUTCHISON, M.D., LL.D., F.R.C.P.

Consulting Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond Street

It may be said of enuresis, as Bacon said of medicine in general, that it is a subject which has been "much laboured but little advanced," for in spite of all the attention that has been devoted to it we are still very ignorant of its causes and mechanism, and largely helpless in its treatment.

For the purposes of this discussion it will be well to define enuresis as "bed-wetting," although it is true that diurnal incontinence is often present as well. On certain points we shall probably all be agreed: that enuresis should not be regarded as abnormal until the child has reached the age of 3; that it is commoner in boys than in girls; that most cases date from birth, although occasionally bladder control is lost after it has once been acquired; that it is worse in cold weather. We shall agree also, I think, that the term "enuresis" should be reserved for functional cases and that examples of incontinence associated with diabetes mellitus or insipidus, with chronic nephritis, with stone in the bladder, and with congenital lower urinary tract obstructions should be excluded, as well as incontinence occurring in cases of epilepsy or mental deficiency.

* Read in opening a discussion in the Section of Diseases of Children at the Annual Meeting of the British Medical Association, Belfast, 1937.

There may be less agreement as to the type of child likely to suffer from enuresis. Some are of opinion that it is commonest in children who are either highly excitable on the one hand or unduly phlegmatic on the other; my own experience has been that enuretics do not differ in temperament from the average.

As to the mechanism of the disorder there has been much speculation, but, broadly speaking, it may be said that the underlying defect is some failure in the neuromuscular mechanism of the bladder, so that the reflex micturition of infancy persists. Further than this very general statement I do not think one can safely go. It has been suggested that the failure is brought about by the cessation during sleep of the control exercised by the higher centres over the lower; but that surely is the case in every child, whether an enuretic or not.

Various contributory conditions or exciting causes have been put forward, some of which are of doubtful validity. I do not believe, for instance, that high acidity of the urine is a cause, and I am very doubtful about phimosis. Threadworms have been specially blamed by some, and their importance as a factor is worth discussing. On the other hand I am quite sure that adenoids and enlarged tonsils, especially if causing obstruction, may sometimes lead to enuresis—explain it as we may.

There is one interesting group of cases, however, which deserves special mention, a group small in proportion to the total number of enuretics, but perhaps larger than we think—namely, those in which the enuresis seems to depend upon a nocturnal polyuria, or, to put it in another way, upon a reversal of the normal relative amounts of day and night secretion. Such cases are not generally recognized, but they certainly exist. They may be detected either by actual measurement of the day and night urine or by finding that the specific gravity of the day secretion is unduly high, that of the night unwontedly low. To explain these cases is difficult. One is tempted to suppose that there must be a delay in excretion or some vasomotor factor at work, but these are matters we might well discuss.

There is likely to be some difference of opinion as to the part played by psychological factors in the production of enuresis. For my own part I have not found it commoner in difficult and "maladjusted" children than in others, and I confess I am not convinced of the reality of some of the alleged causes put forward by the extreme Freudians. It must always be remembered that those who work in child guidance clinics are seeing a selected material. They miss the sanifying atmosphere of the general out-patient department.

Prognosis and Treatment

As to prognosis it will be generally admitted that enuresis usually disappears before puberty, although its continuance into adolescence is all too common, and it persists even into adult life oftener than is supposed. When all allowance is made for the fact that it is commonly recovered from, it is none the less a real nuisance, for it may interfere seriously with the patient's education and choice of a career, besides being a great social handicap. As a French writer has put it, the enuretic is often "socially dead."

It is the question of treatment, however, which must chiefly interest us in such a discussion as this, and we must all, unfortunately, be convinced that there is no one plan which is sure of success; the very number of the remedies proposed is proof of this. It must also be noted that in a condition which may undergo sudden and spontaneous improvement and the severity of which is affected even by such extraneous circumstances as the weather, it is more than usually difficult to assess the value of any particular measure, and often enough the remedy which is being used when spontaneous improvement happens to set in gains undeserved credit.

General Management

As far as the general management goes there is not much room for difference of opinion. All admit the importance of a firm mattress, adequate bed coverings, and abstinence from the ingestion of much fluid in the later hours of the day. "Accidents" may be rendered less disagreeable by the wearing of a thick pad of sphagnum moss, and I have sometimes, in the case of adolescents, recommended the use of a rubber urinal such as is worn by patients suffering from incontinence the result of spinal paralysis.

The "taking up" of the child when the mother goes to bed is really only a way (I would suggest) of dodging unpleasantness. It cannot be really curative, for the normal child does not need to be so "taken up." None the less, it is a proper part of treatment.

Remote causes should be dealt with. By all means get rid of threadworms, although I cannot agree with some enthusiasts that they are the main cause of enuresis. I doubt if phimosis is worth dealing with, except on its own merits (or demerits), but I am convinced that I have seen cures result from the removal of tonsils and adenoids.

Use of Drugs

Among drugs belladonna has remained the most popular ever since it was first recommended by Bretonneau more than a hundred years ago, but its mode of action is ill understood. I usually give a dose about 5 o'clock in the afternoon and another at bed-time, gradually increasing the quantity up to a point just short of toxicity. It should be continued for some weeks and then gradually left off. Ergot also has a considerable reputation, although it is less used than formerly. It is difficult to see pharmacologically how it can do good, but I have had at least one case of the nocturnal polyuria type in which it seemed quite definitely to control the enuresis. Ephedrine has lately been recommended in a half-grain dose at bed-time, increased by another half-grain every week. It is said to act by increasing the tone of the sphincter whilst relaxing that of the bladder musculature. It will be interesting to learn the experience of anyone here who has tried it extensively. The endocrines, I think, will not help us much. A good deal has been claimed for thyroid in the case of the phlegmatic child with enuresis, but I consider the claims exaggerated. Pituitrin, from its antidiuretic action, ought theoretically to be useful, especially in the nocturnal polyuria cases, but it is an inconvenient substance to administer, and I have had no experience of it. I gather that those who have tried it have been disappointed with the results.

Psychotherapeutic Methods

The more heroic and semi-surgical procedures such as epidural injections, the passage of sounds, and so forth will, I imagine, be condemned by most of us, so we are left only with psychotherapeutic methods. As to the value of these there is considerable difference of opinion, although all are at one about the importance of creating the right psychological atmosphere for treatment by seeing that the disability is regarded in a common-sense and unemotional way and that the patient is not allowed to be either frightened or fussed. But can we do more than

this? Suggestion has been used in an endeavour to teach the child "to control the bladder during sleep." But can any child—or adult for that matter—be expected to exercise such control? Hypnotism I have never practised myself, and I have not been impressed by the results it has yielded in the hands of others. There is a form of suggestion for which success has been claimed in America and which consists in the weekly subcutaneous injection of 1 c.cm. of sterile salt solution. It is impressed upon the child at each injection that the treatment will certainly abolish the enuresis, but that if this should persist further injections will be required. For my own part I regard such treatment as a disguised form of punishment hardly to be distinguished from the use of the nurse's palm, and, besides, we should not lie to the young.

Of the more severe psychotherapeutic procedures such as Freudian analysis I cannot speak from any experience, but their use seems to me disproportionate to the object and rather like breaking a butterfly on the wheel. The value and limitations of this as of other methods of treatment in enuresis, however, it is one of the chief objects of this discussion to make clear.

CARE OF THE VOCAL CORDS IN SINGERS AND SPEAKERS*

BY

SIR MILSOM REES, G.C.V.O., D.Sc., F.R.C.S.Ed.

Laryngologist to the Royal Opera House, Covent Garden, and the Guildhall School of Music

In considering the care of the voice it will serve the purpose best if examples are drawn from experience with outstanding artists, just as, along other lines of achievement, one would take those who excelled in sport or politics. Therefore I shall point my moral by reference to some of the world's greatest singers as they have been heard from time to time at the Royal Opera House, Covent Garden, with which I have had a close connexion for over a generation. The same principles will apply to all who make exceptional use of the voice in their professions.

It is necessary first to ask, "What is singing?" and that opens up a previous question, "What is sound?" Sound is defined, from the physical point of view, as vibrations appreciable to the ear. Noise is the beating of the waves of air upon the ear-drum in irregular fashion, while in music the impingement is regular and periodic. In singing or speech the vibrations originate in an expiratory current from the lungs passing the edges of the vocal cords and setting them in motion, just as in the violin or other stringed instrument the pulling of the string creates the air waves and forms the note. The lowest audible vibration is 32 times a second; the highest, one of 76,000 times a second; but in music the vibrations employed range from 40 to 4,800, representing seven octaves.

In chest notes the entire length of the vocal cords vibrates; in head notes the length is shortened according to the note required. Falsetto notes are due to the false vocal cords situated immediately above the true ones acting as a damper on the outer part of the latter. The following table gives numerically the vibrations of the vocal cords for different voices:

	Vibrations per second	Average wave-length
Bass	87–256	12 ft.
Baritone	106–341	
Tenor	128–435	6 ft.
Contralto	160–512	3 ft.
Mezzo-soprano ..	192–640	
Soprano	..Up to 768, occasionally higher..	1½ ft.

The beauty and the carrying power of the voice depend upon the breath control, which produces the requisite vibrations of the cords kept in a properly tense condition by the nerves of the larynx, together with a proper posing of the voice to obtain resonance from the sinuses of the head, these acting as resonating cavities or sounding-boards and also amplifiers. The best voices naturally are those which have the most and finest elastic tissues in the cords. If the edges of the cords are viewed with the laryngoscope during singing they appear as sharp as razor blades in the great sopranos. Bad tuition produces tiredness and redness of the cords, overstretching of the elastic fibres, and occasionally the appearance of nodules, while exceedingly bad tuition may even break the fibres and cause minute haemorrhages.

One inexperienced teacher sent me his first twelve pupils, three of whom had torn vocal cords as a result of his curious methods.

Modern Singing

Modern singing as taught to-day started only two and a half centuries ago. When one bears in mind the very small percentage of the population who can sing in any sense that can be called singing, the much smaller percentage who can sing really well, the relatively few who take up singing professionally, the fewer still who make a success of it even after years of serious training and great expense, one is led to the conclusion that singing is not a natural endowment, that the vocal cords were not constructed by Nature for singing purposes. Singing is an acquired accomplishment, into the service of which have been pressed certain organs not intended for it. The same conclusion is suggested by the multitude of troubles that afflict even the best singers.

If this be true, then there is no such thing as a natural singing voice. I have never heard of a leading opera singer who had not been taught how to sing. Singing is an acquired art, and that being so it follows that with more definite methods of teaching, greater experience, some anatomical knowledge, and care of the vocal cords, the best voices are yet to be heard.

Although many of the suggestions in this paper apply to the speaking voice as well as to the singing voice, the demands upon the singer are much more critical. An advocate in a court of law may use his voice for five or six hours a day and for several days running with no congestion of the vocal cords. He may permit himself occasional declamation, but apparently his voice is as tireless as, one may hope, is the attention of his auditors. Singers, on the other hand, after a long and heavy opera are often thoroughly exhausted and quite unfit for any renewal of the effort next day. It must be remembered, of course, that they have to act as well as sing, that frequently they are heavily clad, and very generally have more than the normal allowance of flesh. But one has only to consider the immense number of vibrations of their vocal cords, and the force with which their voice is projected, to understand that during their performance they are like engines running at excessive speed. These high notes with heavy volume mean an enormous strain, with subsequent exhaustion.

* Read in opening a discussion in the Section of Oto-rhino-laryngology at the Annual Meeting of the British Medical Association, Belfast, 1937.

Conditions of Modern Opera

Modern opera is more exacting to those who take part in it than it was in the leisurely Victorian and Edwardian days. The aeroplane enables the tenor to fly from Munich, Rome, or Paris to Covent Garden in time for a rehearsal the day before the advertised performance. Frequently the change in a few hours from a dry and warm climate to the wet and cold conditions of London causes a slight catarrh, of which the ordinary member of the community would take no notice, but to the singer and his audience is of crucial importance. The position of the laryngologist in attendance is also onerous. He has to ask himself whether by simple measures he can get the great artist through his performance—a matter to be decided immediately, because in opera it rarely happens that should a breakdown occur another celebrity, knowing the particular role, is at hand to take his place. Last year at the beginning of the season the tenor in *Lohengrin* suddenly developed laryngitis. By a fortunate coincidence Herr Melchoir called at the Opera House at 7.30 that evening, and within less than an hour he was in borrowed costume taking the place of the other. But such happy accidents cannot be counted on in opera. When this last season opened in damp weather one after another of the singers became catarrhal, although all got through and were better next day. One artist even went through his performance with acute congestion of the middle ear. It may be mentioned that Dame Nellie Melba made it a rule to have her nose and throat cleansed each morning of her performance, and my friend the late Sir Edward Marshall-Hall found his brain clearer for having his nose and post-nasal space sprayed out each day when conducting his long cases. Such a method also helps the resonance of the voice, one of the principal qualities in voice production. It is not merely a question of regular vibrations of the cords, but in class singers it is the resonance which, when well produced, will distinguish the best from the good.

Sometimes the teacher of music will send a pupil to the laryngologist to discover whether he is a tenor or a baritone or she a soprano or mezzo-soprano. Again and and again teachers bring their pupils because of no improvement or, worse still, because of the obvious results of wrong production of the voice. It does not follow that because of a few successes all pupils should be taught alike. It is necessary for the laryngologist to have standards of voices and vocal cords in his mind, such as those of Melba, Patti, Schumann, de Reszke, Caruso, Tauber, etc., if possible. Ask these pupils to sing a few scales, or a few bars of one of their favourite tunes: or, if grand opera singers, a part of their next opera, especially after treatment. Jean de Reszke, whom I have no hesitation in describing as the greatest artist the world has ever heard, was originally a baritone. It was as such that he made his first public appearance in Venice in 1874. Then he retired for a period, during which his voice gained remarkably in the upper register, and when he made his reappearance in Madrid in 1879 it was as a tenor. From that time his great fame as a singer, especially in Wagnerian parts, can be dated. The consequence was that people with indifferent voices went to him during his many years as a teacher—he taught almost until the day of his death in 1925—in the expectation of being made into tenors. Some of them he sent over to me. Very few were genuine tenors—the majority were baritones, and would never be anything else—but all were desirous of becoming tenors, or of being able to boast that they had been taught by Jean de Reszke.

In the great operas, especially the German, practically all the tenors have baritone cords to enable them to carry on their tremendously heavy work, forcing their voices through perhaps an orchestra of 120. One has only to listen to the voice of a Siegfried—or a Brünhilde—bursting through a huge orchestra to realize the strain it must impose. Only a few can take such parts without injury to their cords. That is why singers, particularly tenors, have a very short singing life.

Another point to remember is the frequency of injury to the cords in sopranos. Melba, when near the end of her career, would very occasionally in the last act of *Faust* make an error in her production, and twenty minutes later a little mucous vesicle might have been noticed at the edge of one of her vocal cords, disappearing in a few days after rest and treatment. Tetrazzini had haemorrhages of the vocal cords on two occasions, due to a slight tearing of the fibres. Another trouble, found more especially in tenors, is the development of nodules that remain until the end of their career if they go on working, as they usually do, with insufficient rest and treatment. Yet another trouble is loss of elasticity of the fibres through overstrain by using the chest notes instead of the head notes in the high passages. This was particularly shown in the very outstanding tenor Saleza, who would have been more famous had his period not coincided with that of Jean de Reszke. Singers' voices inevitably deteriorate with age, though in this country that is perhaps less appreciated owing to the extraordinary fascination which old favourites continue to inspire. The British public always wanted Patti for as long as she would sing even "Home Sweet Home" when she was turned seventy.

Treatment

The laryngologist called to attend a singer has first to determine the nature of the complaint. It may be local or general, or both. Dismissing general or chest conditions, and confining ourselves to this department of rhino-laryngology, we find that of all local troubles by far the most common come under the head of catarrhal, affecting the nose, post-nasal space, pharynx, larynx, and trachea, or it may be only the nose and post-nasal space, or only the trachea. In this respect we are fortunate in that the vocal cords themselves are the last part of this delicate apparatus to be affected. If therefore the congestion of these areas can be reduced it may be assumed that the vocal cords will remain free. The procedure I have found most helpful is to douche the post-nasal space through the nose with an alkaline solution to which a little menthol is added. The pharynx also should be well sprayed. My usual procedure is as follows: I use an inhalation of No. 2 nebuling compound with a coarse vaporizer, and finally an inhalation through the nose, and likewise through the mouth, of kasemol in paroleine (K.P.) and menthol in paroleine (M.P.) 1 per cent. in equal parts. Before douching through the nose I spray the inferior and middle turbinate by means of a fine spray with a very small amount of 1 per cent. cocaine. My 1-oz. spray suffices for at least thirty patients; so the amount used is particularly small. Should the pharynx be in a chronic condition then a slight spray consisting of

℞	Tinct. ferri perchlor....	ʒ ss
	Stovaine	gr. v
	Menthol	gr. v
	Sp. vini rect.	ʒ iii
	Glycerin	ʒ iii
	Aq. dest.	ad ʒ i

may be recommended. This mixture, which must be shaken before spraying, proves very useful in all chronic catarrhal conditions of the throat.

Should there be nodules on the cords the mixture should be sprayed direct on to the cords daily, and the patient himself should be instructed to practise inhalation of K.P. and M.P. through a coarse spray from four to six times each day. If the nose alone is congested the solution may be employed plus drops of a mixture consisting of stovaine, carbolic acid, and ephedrine, 0.5 per cent. of each in paroleine. When there is tonsillar trouble a thorough washing with the alkaline solution mentioned should be given, followed by any antiseptic which is favoured.

Tonsil Operations

A word may be added about the undesirability of operations on the tonsils in the case of established artists. These people have taken years of study to obtain their form of voice production. In a large proportion of cases a tonsil operation will bring about some alteration of the voice, and when deterioration of the voice eventually occurs, as it does naturally, it is very likely that the surgeon's intervention will be blamed. The largest tonsils I have ever seen were those of a world-famous tenor and of a world-famous contralto. The time for tonsillar operation, if this is advisable, is during the early period of training before the tone production has been permanently set. Removal of the inferior turbinates should be avoided in singers. Enlarged inferior turbinates should be treated with the galvano-cautery. Deviated septa, save in exceptional cases, should remain untouched.

Finally, the laryngologist in this special field has occasionally to deal with a type of patient of whom specialists in other branches of medicine are generally free. Acute stage fright is not unknown in all classes and callings, but when the patient is a prima donna the case becomes formidable. It does sometimes happen that a lady of repute in the operatic world who wishes to create a sensation does so, not by singing but by refusing to sing. The disturbing announcement is usually telephoned to the Opera House on the morning of the performance. It has the highly satisfactory result for the lady that her name is written large in the evening papers, but for the management it is a matter of grave concern. Even if another prima donna be nearer than the next capital she has to be solicited to sing; she is naturally reluctant to take another's place when she has had no previous publicity, and the very idea of being a substitute may offend her *amour propre*. The public, too, have to be considered. They have paid to hear one particular lady, and they demand a return of their money. To put on another opera means great difficulties in engaging fresh artists and chorus and obtaining scenery which may be under some railway arch miles away. The delicacy of the task of the laryngologist who has to give an opinion on the lady in question will be readily appreciated, as well as his courage in facing her wrath should he pronounce her fit to fulfil her contract—but as her arias remain unsung perhaps the story is better unwritten.

The Duchess of Portland has issued an appeal for "the many old trained nurses who worked for very small salaries in the past, and whose tiny savings were used to help relatives or dwindled away as they themselves became old and ill. Not many people realize that there are hundreds of them living in great poverty in lonely rooms, without enough food and warmth." Gifts, large or small, should be sent to the Duchess of Portland, c/o The Nurses' Fund for Nurses, 95, Dean Street, W.1.

THE OBSTETRICAL SIGNIFICANCE OF PELVIC VARIATIONS*

A STUDY OF 450 PRIMIPAROUS WOMEN†

BY

HERBERT THOMS, M.D., F.A.C.S.

(From the Department of Obstetrics and Gynecology, Yale University School of Medicine)

During the past decade the development of roentgenological methods for measuring the dimensions of the bony birth canal has brought about a revival of interest in pelvic architecture, particularly in its relation to childbirth. The present study of pelvic mensuration represents the findings in a series of 450 primiparous white women consecutively delivered at term (their children weighing 2,500 grammes or more) in the New Haven Hospital. The system of roentgen pelvimetry we have adopted is the so-called "grid method" (Thoms, 1933; 1935), which was developed in this clinic. In addition we have employed roentgenometry of the lateral aspect of the pelvis in many instances, and in the latter part of the series we have used a newly modified lateral technique as a routine (Thoms and Wilson, 1937). The observations extend over the past three years, and the group represents all the white primiparous women who during that time have been registered for pre-natal care prior to their delivery in the hospital.

Types of Pelvis

That the bony pelvis is subject to variations in contour is not a new concept. A half-century ago William Turner (1886; 1886a) emphasized the frequent occurrence of pelvic variations, particularly as related to the superior strait. This author divided pelves into three groups—namely, dolichopellic, mesatipellic, and platypellic types—according to the pelvic index—that is, $\frac{\text{A.P. diameter} \times 100}{\text{Transverse diameter}}$. Our own classification is based largely on that of Turner; however, we employ as a criterion the length of the antero-posterior diameter of the superior strait in its relation to the length of the transverse diameter. We suggest, therefore, that for clinical purposes there are four variations in which the majority of pelves may be grouped for classification. These are:

1. Dolichopellic or anthropoid type.—The antero-posterior diameter is longer than the transverse.

2. Mesatipellic or round type.—The antero-posterior diameter is equal to or only slightly less than the transverse (the difference never more than 1 cm.).

3. Brachypellic or oval type.—The antero-posterior diameter is between 1 and 3 cm. shorter than the transverse.

4. Platypellic or flat type.—The antero-posterior diameter is excessively shorter than the transverse—3 cm. or more.

On the basis of the length of the antero-posterior diameter these first three groups (which more commonly occur) may be divided for purposes of clinical use into large, average, and small pelves, as follows:

1. Dolichopellic type: A.P. diameter 14 cm. or more, large pelves; between 12 and 14 cm., average pelves; 12 cm. or less, small pelves.

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* Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Belfast, 1937.

† This study was made possible through the Research Funds of Yale University School of Medicine.

2. Mesatipellic type: A.P. diameter 13 cm. or more, large pelves; between 11 and 13 cm., average pelves; 11 cm. or less, small pelves.

3. Brachypellic type: A.P. diameter 12 cm. or more, large pelves; between 10 and 12 cm., average pelves; 10 cm. or less, small pelves.

It is obvious that the above classification is chiefly useful in depicting the shape of the superior strait. In describing a given pelvis, therefore, it may be necessary to use additional terms—for example, such terms as "mesatipellic type with narrow forepart" or "dolichopellic type with funnel outlet."

In the present series, in addition to the roentgenometric procedures mentioned above we have employed external outlet pelvimetry as described by Williams (1931); vaginal touch in the determination, when possible, of the diagonal conjugate diameter; and the usual external measurements, interspinous, intercristal, intertrochanteric, and external conjugate diameters. With regard to these latter measurements, as I have pointed out previously (Thoms, 1934), we find no useful correlation between them and the actual superior strait dimensions as revealed by roentgenometry.

Incidence of the Various Types

The incidence of the above types of pelves in the series of 450 white women is given below.

	Large	Average	Small
Dolichopellic type occurred 70 times, or 15.5% ..	6	53	11
Mesatipellic „ „ 203 „ „ 45.1% ..	17	145	41
Brachypellic „ „ 156 „ „ 34.7% ..	27	110	19
Platypellic „ „ 21 „ „ 4.6% ..	—	—	—

It will be noted from the table that the mesatipellic or round type was definitely predominant. This is an interesting fact, inasmuch as in the past many authors have assumed that the brachypellic or oval type represented the normal female pelvis. The predominance of the mesatipellic type in previous similar studies has led me to believe that nature's pelvis is round and not oval, a fact which has been emphasized by Vaughan (1937) and discussed at length by myself in a recent article entitled "What is a Normal Pelvis?" (Thoms, 1934a).

Interesting also in this series is the incidence of outlet contraction as measured by the inter-tuberal distance. When this distance is 8 cm. or less such a pelvis is designated as funnel in type. The incidence is as follows:

Dolichopellic type	21 times, or 31.0%
Mesatipellic „	38 „ „ 18.7%
Brachypellic „	30 „ „ 19.2%
Platypellic „	4 „ „ 19.0%

The increased incidence of the narrow outlet in the dolichopellic type is not unexpected, inasmuch as narrowing of the side walls of the entire pelvis appears to be characteristic of this group.

Incidence of Operative Intervention

In surveying the history of the labours certain facts seem to be of interest, and these will be briefly considered. The incidence of operative intervention is recorded as follows:

Dolichopellic type	11 times, or 15.7%
Mesatipellic „	37 „ „ 18.2%
Brachypellic „	31 „ „ 19.8%
Platypellic „	7 „ „ 33.3%

These operations are divided thus:

Caesarean section	13	Mid-forceps operation ..	10
Version and extraction ..	3	Low or outlet forceps ..	60

The incidence of the low or outlet forceps, sixty times in 450 labours, deserves comment, because many of these patients might have delivered spontaneously if spontaneous birth were an object in itself. We believe, however, that in many instances where the second stage is prolonged primiparous patients may be more satisfactorily delivered by this means. Some authors have used the term "forceps control" for this indication, which is a descriptive term and should perhaps be adopted.

The Caesarean sections, thirteen in number, may be grouped according to pelvic type as follows:

Dolichopellic type	0 times, or 0% incidence
Mesatipellic type	1 „ „ 0.5% „
Brachypellic type	8 „ „ 5.1% „
Platypellic type	4 „ „ 19.0% „

Ten of the above operations were on patients with small pelves in which the indication seemed to be obvious disproportion. In three there was no pelvic indication, and the operation was performed for: (1) pregnancy complicated by heart disease; (2) transverse presentation with early ruptured membranes; (3) borderline small pelvis in an elderly primipara (aged 45). The incidence of operative procedure in the series again seems to emphasize that the round or mesatipellic type pelvis is nature's pelvis, for spontaneous birth has a greatly increased incidence in this type.

Breech Presentation and Occipito-posterior Position

Breech presentation occurred in the series as follows:

Dolichopellic type	7 times, or 10%
Mesatipellic type	6 „ „ 2.9%
Brachypellic type	7 „ „ 4.4%
Platypellic type	0 „

The relative increase of breech presentation in the dolichopellic type (10 per cent.) offers ground for interesting speculation, and whether this increase will be found in a larger group remains to be seen.

The occipito-posterior position was observed in the following cases:

Dolichopellic type	13 times, or 18.6%
Mesatipellic „	22 „ „ 10.8%
Brachypellic „	13 „ „ 8.2%
Platypellic „	2 „ „ 9.5%

In our clinic pelvic examinations during labour are in general limited to rectal touch. It is probably true, therefore, that many cases of high posterior position which subsequently undergo spontaneous rotation to anterior position remain undetected. The above figures represent cases of posterior position of the occiput in which there was no doubt of their existence in the examiner's opinion. The comparatively high incidence of occurrence in the dolichopellic group I previously emphasized in 1933 in a paper entitled "A Type of Pelvis Intimately Associated with Occipito-posterior Position" (Thoms, 1933a).

Mortality Statistics

In this series there were no maternal deaths; six foetal deaths occurred, and these are summarized as follows:

1. 4,000 gramme stillborn macerated foetus; cause of death unknown (low forceps).

2. Stillbirth associated with hydrocephalus, spina bifida, club-feet (mid-forceps).

3. 3,500 gramme foetus; death intra partum of patient with severe pregnancy toxaemia (mid-forceps); small mesatipellic type.

4. 4,059 gramme foetus, stillborn after version extraction in small brachypellic type pelvis.

5. 3,145 gramme foetus; died two hours after mid-forceps operation in very obese patient with uterine inertia.

6. 3,510 gramme foetus, stillborn following breech extraction.

It seems reasonable to assume that the first two cases have little or no association with the type of pelvis or method of delivery, and as far as this study is concerned a corrected foetal mortality should exclude these, and is then 0.88 per cent. The gross foetal mortality for the series is 1.33 per cent.

Conclusions

It seems obvious from this and other studies that we should reconstruct our views with regard to the so-called normal female pelvis as it occurs in our adult white female population. This is evidenced by the fact that in this series the oval or brachypellic pelvis occurred in but 35 per cent. of cases. The classification here proposed seems to be of real practical value in our experience.

The chief value of exact pelvimetry by roentgen methods is undoubtedly manifest in cases of suspected disproportion. In this connexion the lateral roentgenometric technique referred to is of great importance. This is particularly true in those cases where at the beginning of labour the foetal head remains high at the superior strait and in which disproportion may be suspected.

In conducting labour in the dolichopellic type of pelvis it should be remembered that the longest diameter of the superior strait is antero-posterior and that this antero-posterior lengthening in most cases extends throughout the bony birth canal. This knowledge should therefore be useful in the treatment of cases of persistent posterior position and in directing the course of the aftercoming head in breech delivery.

Finally, with such simple roentgenometric methods at our disposal their routine use in primiparous patients seems justified and likely to be of great service.

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The annual international symposium organized by the Ligue Française contre le Rhumatisme will be held on October 9, under the presidency of Professor Laignel-Lavastine, and will be devoted to the subject of radio-active treatments in rheumatology. Physicians, radiologists, hydrologists, and surgeons who are interested in this subject are invited to attend. The papers will be published in the October issue of the *Revue du Rhumatisme* and sent to all the subscribers before the meeting. Reduced railway fare and free admission to the International Exhibition will be granted to members of the symposium. A detailed programme will be sent on application to Permanence de la Journée du Rhumatisme, 23, Rue du Cherche-midi, Paris VI[e].

TREATMENT OF TENNIS ELBOW*

BY

G. PERCIVAL MILLS, F.R.C.S.

Surgeon, General Hospital, Birmingham; Surgeon, Royal Cripples Hospital, Birmingham; Orthopaedic Surgeon, Birmingham Children's Hospital

"Tennis elbow" occurs mainly in tennis players, but occasionally in golfers, and more rarely in metal workers and amateur gardeners who use respectively the hammer and the trowel. There is practically never a history of injury—the pain comes on gradually during or after the favourite pastime. The most prominent symptom is pain on the outer side of the elbow when gripping, and this pain is usually much worse on gripping with the forearm pronated; indeed, the grip in the supine position is often painless. The pain may come on while grasping some trifling object like a tea-cup, which may even be dropped, but most characteristically it occurs only during indulgence in the favourite game. It may be merely a nuisance and noticed only on mishitting a back-hand shot, but in some cases the patient cannot even hold a racket. On examination there is nothing to see, but there is always a tender point, either exactly over the radio-humeral joint, on the epicondyle just above, or in the extensor group of forearm muscles. It may be difficult to locate the exact spot, but the patient can nearly always find it, and pressure on it will make him wince.

Physical Signs and Treatment

Of fifty-eight cases of which I have full notes the tender point was over the joint—front, back, or side—in thirty-two, the epicondyle in twelve, and somewhere in the muscles in fourteen; but the respective points are so close together that certainty as to the exact position is not always possible. As an example of this I would quote a case which I classified as of the muscular type and thought I could feel a bursa. At a subsequent operation the bursa was found to be a protrusion of synovial membrane from the radio-humeral joint. Clearly this should have been classified as the joint type. The only other physical sign is a slight limitation of extension at the elbow-joint, more evident and often only evident with the forearm pronated; this occurred in approximately two-thirds of my cases, and is, I believe, the essential indication for manipulation. It may be very slight and no more than a springy resistance to complete extension, which is not felt in the opposite limb. It may be so slight, in fact, that it can be overlooked. On two occasions I have noted no limitation of extension, but against my general rule have for some special reason tried manipulation. In each case I obtained further extension with a definite click, and in each case there was a quick cure. Any gross limitation of extension, such as could be measured with an arthrometer, would suggest a much more serious lesion than the condition we are considering. In cases which present this typical limitation of movement the tender point is usually over the radio-humeral joint (74 per cent.), less frequently over the epicondyle (26 per cent.), and never in the muscles themselves.

Cases with muscular tenderness are of an entirely different character. My practice has been to advise manipulation only in cases in which I found limitation of movement. The technique, which I described some years ago, is very simple. Under nitrous oxide anaesthesia

* Read in opening a discussion in the Section of Orthopaedics, including Treatment of Fractures, at the Annual Meeting of the British Medical Association, Belfast, 1937.

the elbow is forced into full extension with the wrist and fingers flexed and the forearm pronated. At the same time, in epicondylar cases firm pressure is made over the tender point with the thumb of the hand which is controlling the elbow. When this movement is carried out one of five things is observed.

1. The elbow comes straight with a click, which gives one the impression of something slipping in the joint (thirteen cases).

2. It comes straight gradually, with a feeling as if adhesions were giving way (seven cases).

3. It gradually comes straight with continued effort, but neither click nor adhesions are felt (seven cases).

4. As soon as the patient is under the anaesthetic the elbow comes straight without the slightest resistance (three cases).

5. The elbow cannot be got straight (one case). This, of course, was a failure, and will be referred to later.

The routine after-treatment is simply two weeks' rest from tennis or golf, during which time the patient is instructed to maintain by daily exercises the extension that has been secured.

Results

Of thirty-three cases so treated twenty-two were cured within a fortnight; one was improved and could play tennis at once, but was not perfectly right for six months; three others took two, three, and four months respectively. Some of the cases were dramatic. One patient, for example, could not write, and on coming round from the anaesthetic he sat down and wrote me out a cheque, and naturally we were both impressed. A large number of the cases occurred in doctors and personal friends who would not hesitate to let me know if I had failed; in fact, the frequency of the condition among doctors has been a little disconcerting from the purely financial point of view. So much for the good side of the picture. Of the remaining seven cases three were apparently cured but subsequently relapsed, and these must be considered individually. One neglected his fortnight's rest and relapsed suddenly within that period; he was a medical man and insisted on a second manipulation, which cured him. One relapsed in five weeks, and the opposite elbow also became affected; this was probably an early general arthritis which I had overlooked. One relapsed in three months: he was 51 years of age, and gave up tennis.

Of the remaining four cases one has not been traced, and though the immediate result was satisfactory I should not like to call it a cure; the other three were utter and complete failures. One of these was an abnormal case, for, though there was pain in the elbow and limitation of extension, there was absolutely no pain on gripping. The diagnosis in this case was probably incorrect, but the patient came from a far Northern town and I have had no opportunity of seeing him again. The second case should have been a cure: there was limitation of extension, which corrected with a click, and when I saw the patient a month later movement was complete. However, he still had his pain, and this case I cannot explain. The third case in which I failed is more interesting; this was the one referred to above in which I did not succeed in forcing complete extension. This patient went to Blake in London, who also failed. A year later he was cured by manipulation by the trainer to one of our local football clubs. He very kindly told me all about it, and it is clear that the trainer succeeded in securing full extension, which both Blake and I had failed to do.

It appears, therefore, that, taking limitation of extension as an indication for manipulation, twenty-seven cases out of thirty-three were cured, and one other was subsequently cured by manipulation elsewhere. During the same period six cases were seen in which manipulation was advised but for some reason was not carried out by me. The ultimate fate of these cases is interesting in view of the possibility of spontaneous recovery. I have succeeded in tracing five. Three when last heard of were still unrelieved; one had the manipulation done by an osteopath and was cured, and one recovered after a few weeks' rest and massage.

Conclusions

We are justified in saying, therefore, that when the typical syndrome is present spontaneous cure is unlikely, and that manipulation gives an immediate cure in two-thirds of the cases and a slightly delayed cure in another one-sixth, making five-sixths in all.

Cases with muscular or epicondylar tenderness and no limitation of movement are in quite a different category. Some of them are suffering from what, to conceal our ignorance, we call muscular rheumatism or fibrositis, and the part which is over-used is naturally affected first. They soon show lesions in other parts of the body. I have seen three cases which started as apparent tennis elbow and subsequently developed a generalized fibrositis. Most of the muscular cases, however, are simply the result of overstrain, and a prolonged rest is the best, though far from welcome, treatment.

Pathology

I have left this to the end because it has to be deduced from the results of treatment. I believe that the common type of case with joint tenderness and limitation of extension is due to a fraying of the thin edge of the coronary ligament and the nipping of a semi-detached portion between the bones. My reasons are as follows:

1. The condition is frequently cured dramatically by a manipulation which produces a click.

2. It may relapse suddenly and be cured by a further manipulation. This happened to a medical man, referred to above.

3. In a case treated without anaesthesia the patient was certain that something had slipped back into place. He came to me in the middle of an important tournament and said he could not even hold a racket. A few hours after manipulation I watched him play a fine game.

4. On one occasion I opened the radio-humeral joint and found the thin edge of the coronary ligament frayed out as I have suggested.

5. The similarity to a displaced internal semilunar cartilage is very striking. Curiously enough, my manipulation for tennis elbow is exactly analogous to Sir Robert Jones's manipulation for reducing a knee cartilage.

I believe, therefore, that the dramatic cure that occurs in some cases is due to the freeing of a frayed edge of the coronary ligament which has got displaced between the bones. Cases with epicondylar tenderness are also often cured by manipulation, always provided there is limitation of movement, but I have noticed that it is seldom so dramatic as in the joint type. Patients often say that the elbow felt better from the first, but that it was a few weeks or months before it became quite right. I can only suppose that some tense bands, which were painful on being stretched, are ruptured completely by the manipulation.

Clinical Memoranda

Succinic Acid Treatment of Diabetic Ketosis

Dr. Korányi and Professor v. Szent-Györgyi have just published an important paper on their successful treatment of diabetic ketosis by succinic (amber) acid administered by mouth (*Dtsch. med. Wschr.*, 1937, **63**, 1029). With the chemical theory which they advance to explain its action we are not at present concerned, but with the five cases successfully treated the province of diabetic therapy is immediately involved. In four severely ketosed insulin cases the records, which read convincingly, show that, even after the omission of insulin, 10 grammes of succinic acid by mouth removed all ketosis in two to three days and much smaller doses subsequently prevented any recurrence of acetone bodies in the urine. Hyperglycaemia and glycosuria were scarcely at all reduced. A fifth case gave less definite results. From their clinical experiences they seriously suggest the possibility of treating severe diabetes with succinic acid instead of with two or three injections of insulin a day. At the same time they think their results need confirmation by other workers.

Unfortunately an English newspaper published in June the hopes raised by this new oral treatment—even before the above scientific paper was produced. Since then we have been mildly pestered by patients wanting the new amber acid instead of insulin, and we feel that we should publish at once the *completely negative and clear-cut results* we obtained on two patients in June. This experimental trial was undertaken at the suggestion of the Medical Research Council, who were requested by Professor Szent-Györgyi to give the treatment a trial. Two elderly women were chosen for the experiment; both showed a heavy ketosis and were judged to require insulin treatment as diet had failed to control the diabetes.

CASE RECORDS

Mrs. A., aged 64, had suffered from pruritus vulvae intermittently for two years, and an acute thirst for only two weeks. She was thin and wasted. Mrs. B., aged 59, had had diabetes for four years which had been treated intermittently by restricted diet. Her large face and hands suggested acromegaly: a radiograph showed a much enlarged pituitary fossa, so that her condition was presumably a type of pituitary diabetes.

On admission to hospital, after a period of dietetic treatment as out-patients, both women had a hyperglycaemia of from 220 to 300 mg. per 100 c.cm., and excreted constantly between 3 and 5 per cent. of sugar in all five samples of urine tested daily. The ketosis was uniformly heavy, Rothera's nitroprusside test being deep opaque purple (+++) and Gerhardt's ferric chloride test giving a faint positive reaction in about half the specimens passed. Throughout, the degree of ketosis was judged by these two tests and no quantitative estimations were carried out.

On admission both patients were kept in bed and placed on a diet of 100 grammes carbohydrate, 75 grammes protein, 150 grammes fat, and this was unchanged. The ketosis remained constant for three days, and treatment with succinic acid was then started. Doses of 10 grammes, the biggest dose suggested by the above authors, were given for one week, in capsules to one patient, in liquid form to the other, who could not swallow capsules. The ketosis became progressively heavier and the Gerhardt test changed to a deep red colour (+++) in every sample passed. The hyperglycaemia and glycosuria were unaltered. At the end of a week it was clear that the ketosis was getting progressively worse rather than better, and insulin treatment was begun and, as usual, rapidly removed the ketosis.

The only real difference in experimental conditions between the four successful reported cases and our two failures was the fact that in the former cases the patients had been on insulin before the experiment and ours had not. The diets used were not so materially different as to explain the opposed results. Four successful cases and two failures prove nothing. But it is clearly too soon to advise the treatment of diabetic ketosis with succinic acid instead of insulin.

R. D. LAWRENCE.
R. A. MCCANCE.
N. ARCHER.

Diabetic Department, King's College Hospital.

Two Cases of Perforated Peptic Ulcer

The recent commentary in these columns on gastric perforation in a tabetic (March 6, p. 497) prompts me to record two further cases of perforation.

CASE I.

A man of 50, who had been drinking heavily for some time, had an acute attack of abdominal pain while in a public-house. He managed to walk home, and when I saw him two hours later was a little drunk and complained of pain above the pubes and in the penis. His temperature and pulse were normal, and there was no rigidity of the abdomen. In view of the pain he mentioned I passed a catheter and withdrew a few ounces of normal urine. He gave a history of indigestion for the past few months, but he had not vomited at the onset of the attack. There were no other signs or symptoms.

Three hours later he was in coma. His pupils were dilated, his face flushed, his breathing stertorous, his reflexes absent: he gave the impression of a man deeply anaesthetized. While I was preparing to carry out gastric lavage, on the assumption that it might be a case of alcoholic coma, he died. Post-mortem examination showed a large perforation on the lesser curvature, with the peritoneal cavity full of fluid which had once been beer.

The unusual features were the absence of rigidity, tenderness, and localizing signs, and the very short period—about six hours—between perforation and death. It seems possible that these are due to one factor—namely, the sudden release into the peritoneal cavity of a large quantity of alcohol. At first it acted as an anaesthetic, masking the pain and preventing the rigidity, while later it paralysed the central nervous system and caused the man's death.

CASE II

A man of 37, while working as a labourer, was seized with acute pain in the right hypochondrium of such severity that he fell down. An hour later he was pale and shocked, with a subnormal temperature and a pulse of 100, and still in great pain. There was an area of tenderness and rigidity in the right hypochondrium, but nowhere else. There had been nausea but no vomiting at the beginning of the attack, and there was no history of indigestion at any time.

After an hour's observation the area of tenderness had increased. At operation I found a small perforation of the duodenum, about a quarter of an inch in diameter, surrounded by an indurated area about an inch across.

The point of interest here is the complete absence of any previous symptoms. It is difficult to realize that ulceration can proceed to the point of perforation without giving any pain. I have questioned this patient further, and he still maintains that he "does not know what indigestion is." Right up to the time of his perforation he could eat and enjoy anything that was placed before him.

Brecon, S. Wales. DAVID KYLE, M.A., M.B., B.Ch.

Reviews

DICTIONARY OF PATHOGENIC BACTERIA

Dictionnaire des Bactéries Pathogènes pour l'Homme, les Animaux, et les Plantes. By Dr. Paul Hauduroy, Dr. G. Ehringer, Professor Ach. Urbain, Dr. G. Guillot, and Dr. J. Magrou. (Pp. 597; broché 120 fr., relié toile 140 fr.) Paris: Masson et Cie. 1937.

In this dictionary of pathogenic bacteria by Hauduroy, Ehringer, Urbain, Guillot, and Magrou some 650 organisms have been described, embracing all those bacteria which have been found to be pathogenic for men, other animals, and plants. The book thus has a wider appeal than a purely medical one. The nomenclature followed is that of the American Society of Bacteriologists, the various synonyms being included, and the orders, families, genera, and species within the genus are arranged alphabetically. Since there are probably still some bacteriologists who are not thoroughly familiar with the American classification, a summary of this in chart form at the beginning of the book would have been a useful addition. In a volume of this size the description of individual species is necessarily rather brief, and the space alloted varies to some extent with their importance as a cause of disease. However, the main morphological, cultural, and fermentative characters of the different bacteria are adequately described, but at times serology does not get the full treatment it deserves. In these days when antigenic analysis has attained such prominence and its application in the identification of human pathogens has become so far-reaching, this aspect of the subject might have received more attention. For instance, the many varieties of streptococcus which have been named from time to time are considered under separate names, and no doubt the information given would enable a label to be attached to any given streptococcus. But the use of serological methods probably indicates a more useful separation of the genus into species and types, and this procedure is now receiving greater recognition.

The volume has a useful appendix, which sets forth the antigenic and biochemical reactions of the *Salmonella* as defined by the subcommittee of the Commission on Nomenclature of the International Society of Microbiology. The serological and biochemical reactions of the dysentery bacilli are also recorded here, and in five further tables the metabolic activities of six genera of Gram-negative bacilli are set out in such detail as to allow of differential diagnosis. This book should be of use to the bacteriologist more particularly in the tracking down of the less common species of bacteria encountered in the course of general bacteriological work.

MIDWIFERY IN THE TROPICS

A Textbook of Midwifery in the Tropics. By V. B. Green-Armytage, M.D., F.R.C.P., F.C.O.G., Lieut.-Col. I.M.S. (ret.), and P. C. Dutta, M.B., F.R.C.S.Ed., Capt. I.M.S. Second edition. (Pp. 447; illustrated. 12s. net.) London: Butterworth and Co. (India) Ltd. 1936.

The fact that a second edition has appeared within four years is proof that this book was needed and is appreciated. The staccato style and the manner in which the book is written are not only convenient for students studying in a foreign language, but allow of much material being compressed within a relatively small compass. Very little space is devoted to theory, and in these days of composite authorship the didactic dogmatism is welcome and refreshing. The chapter on diseases associated with pregnancy is concise and adequate, but it is surprising that typhoid fever is not accorded a single paragraph. There are many, particularly in America, who will not agree with the advice to give women in malarious districts 6 grains of quinine daily throughout pregnancy. It is surprising that the authors do not advocate the routine instillation of silver nitrate drops into the infant's eyes, and it is disappointing that they make no mention of rectal examinations, for there is no need, as implied, to make a vaginal examination to discover whether labour has begun. One other criticism must be made, and that is the freedom with which Caesarean section is advocated. Not only is it advised in cases of "failed forceps" associated with occipito-posterior position, but in the section on uterine inertia complicating breech presentation the following sentence occurs: "It is better to do Caesarean section than lose the child." Such treatment may possibly be best in the authors' hands, but would appear to be dangerous teaching in a textbook for students.

This is an excellent book, remarkably free from typographical errors. It contains a surprising amount of information, and is to be heartily commended not only to students in India but also to those in this country.

TREATMENT OF INFANTILE PARALYSIS

Infantile Paralysis and Cerebral Diplegia. By Sister Elizabeth Kenny. (Pp. xxxiii + 121. 21s.) Sydney: Angus and Robertson Ltd. London: Australian Book Company, 37, Great Russell Street, W.C. 1937.

Even if the development of paralysis in acute anterior poliomyelitis could be prevented, the grave problem that this disease presents would not be completely solved. There would still be many cases in which the condition escaped recognition in the earliest stages and which progressed to frank paralysis. Treatment of the established condition will, therefore, for long remain an important consideration. Treatment during the stage of recovery may be summarized as follows: splinting of affected muscles in a position of relaxation from the first; physical treatment begun four to ten weeks after the acute onset, the most important item being graduated exercises; strict recumbency in all cases where anti-gravity muscles are involved; treatment to be continued until recovery is maximal. Unfortunately it is found that a certain number of cases, treated carefully from the first, show very incomplete recovery, and the permanent disability is sometimes serious. Anyone who has had experience of such cases would welcome a new form of treatment that gave uniformly good results. The anguish of the parents of a splendid child who has been stricken with paralysis is not easily forgotten, and it is a sad business to talk to them when it has become apparent that more or less permanent paralysis is certain.

Sister Elizabeth Kenny of Queensland has evolved a system of treatment for which astonishing results are claimed. It has aroused interest and controversy in many parts of Australia, and is now the subject of an investigation in the Commonwealth by a Government Commission. Her methods are described in a book entitled *Infantile Paralysis and Cerebral Diplegia.* She defines the general principles for the treatment of poliomyelitis as follows: (1) maintenance of a bright mental outlook; (2) maintenance of impulse; (3) hydrotherapy and remedial exercises; (4) maintenance of circulation; (5) avoidance of the generally accepted methods of immobilization. The remedial exercises differ little from those usually employed, except that they are begun during the acute stage of the disease and given with great frequency. It is the abandon-

ment of splinting and rest in recumbency (all of which work has been done at out-patient clinics) that is so startling. It is apparently unnecessary to rest a paralysed deltoid by fixing the arm in abduction, or the abdominal muscles by keeping the patient in bed—a complete denial of accepted physiological principles.

But it is the results that matter. Sister Kenny has been responsible for the treatment of about 600 patients, and a small number of them were investigated by a surgeon, Mr. J. V. Guinane. He states that all recent cases have been totally and permanently cured and all long-standing cases have been improved. It is safe to say that such results have never before been reported, and the reader will look eagerly for detailed reports on typical cases. There are none—not a single complete history and no muscle charts. It is this that makes Sister Kenny's book so disappointing, for it is robbed of much of its scientific value through the absence of documentary proof of results that it is the bounden duty of a scientific writer to produce when special claims are made for a new form of treatment. For the same reason we cannot profitably prolong this review. It would have been necessary to examine the conditions under which observations were made, the nature of the controls, and the question of trick movements. Sister Kenny may rest assured that in spite of her departure from widely recognized principles (in the treatment of infantile paralysis) her work will receive sympathetic attention in this country. Let us hope that the official report of the Commission in Australia will be entirely favourable, for no one can be satisfied with things as they are now.

AIR RAID PRECAUTIONS

If Air War Comes. A Guide to Air Raid Precautions and Anti-Gas Treatment. By L. Haden Guest, *M.C.*, M.R.C.S., L.R.C.P. Foreword by the Right Hon. Viscount Dawson of Penn. (Pp. 88. 1s. net.) London: Eyre and Spottiswoode. 1937.

Gas, A Synopsis of Defence Against. By John Fenton, M.B., B.Ch., D.P.H. (Pp. 52. 1s. net.) London: Dale, Reynolds and Co. 1937.

If Air War Comes is a sensible book on a very difficult subject. Works on defence against air raids divide themselves into two classes—those written by persons with experience of war and those written by persons without such experience; Dr. Haden Guest's belongs to the former. He gives a reasonable estimate of the amount of damage likely to be inflicted by air raids. He does not underestimate the horrors of such attacks, but points out the measures which will reduce the casualties as low as possible. The volume is of special importance because the author has been medical instructor to the Air Raid Precautions Department of the Home Office. The chapter of special interest to the medical profession is that on "Doctors, First Aid, and Hospitals." Two of the most important passages in the description of the functions of first-aid posts are as follows: "It is clear from this short description that the success of such decontamination centres will depend on proper order and discipline being maintained . . ." and "Many cases will flock to the first-aid post although they do not require treatment. There will be people instinctively seeking shelter and aid in their distress, friends of the injured or gassed, or those affected by such comparatively innocuous agents as the tear gases and the nose irritants." These sentences indicate one of the possible dangers connected with first-aid posts—namely, that they may become death traps by being congested with unmanageable crowds of people, some of whom are contaminated with mustard gas. In general it is of interest to note that the author considers that mustard gas has maintained its evil pre-eminence as an injurious agent. He estimates that twelve pounds of chloride of lime is necessary for the decontamination of one square yard of road surface. The book only costs a shilling and gives a clear and sensible account of how to reduce the dangers of air raids. It therefore deserves a wide circulation, particularly among the medical profession, who will have a task of exceptional difficulty and danger in the event of air raids.

Dr. John Fenton's Synopsis of Defence against Gas is a pocket volume of condensed information. It contains the notes of courses of lectures given to first-aid organizations, and should be very useful to those attending such courses.

DERIVATIVES OF MILK

Milk Products. By Wm. Clunie Harvey, M.D., D.P.H., and Harry Hill. (Pp. 388; 73 figures. 16s. net.) London: H. K. Lewis and Co. 1937.

The surplus cow's milk produced in this country presents a difficulty for which remedies have been suggested. One plan has been to endeavour to develop a right appreciation by the people of the merits of the fluid. But as the general attitude towards these efforts has been on the whole inadequately responsive, producers have turned their attention to the manufacture of milk into milk derivatives of various kinds. Many of these preparations have deservedly won favour and are being widely consumed in substantial quantities. For these reasons an acquaintance with the manufacturing processes involved has become indispensable to sanitary officers placed in charge of the purity and soundness of the foodstuffs used in their areas.

Useful guidance in this matter is supplied in the book issued by the medical officer of health and the sanitary inspector of the borough of Southgate. In the opening section, which is on ice-cream, the authors note that the substance was introduced into Britain by an Italian in 1860. Up till the time of the European War the business remained largely in the hands of the small producer and the itinerant vendor. Then America awoke to the charm of the delicacy and introduced mechanical plant for its production *en masse*, with the result that it is now a staple article of diet in that country. Following an account of the food value of the product, its bacterial content, and the communicable diseases to which it has on occasion given rise, the authors set forth the methods of production of ice-cream on both the small and the large scale, illustrating them by means of informative drawings and photographs. The procedure for the chemical and bacteriological examination of ice-cream is next detailed, and there is an ample citation of the English general and local statutes bearing upon the control of sales. Reference is made also to procedure regarding ice-cream in Australia, the United States, Holland, and Belgium.

Under the title "Cream," as distinguished from ice-cream, the topics dealt with by the authors include the properties and composition of cream, the breed of cow, the transmission of disease, separation by hand and by machinery, bacteriological and chemical examination, the use of the Hortvet cryoscope, and methods of legislative control. Under the title "Butter and Margarine" food values are considered and the theory and practice of the manufacture of butter are discussed. Faults in flavour and appearance receive due attention, and the chemistry and bacteriology of butter are adequately presented. Whey butter, milk-blended butter, and what is known as "reno-

vated" butter are referred to also. The manufacture of margarine and the legislative control of both substances conclude this section.

The subjects of the remaining sections, which are equally comprehensive, are cheese, condensed milk, evaporated milk, dried milk, and subsidiary milk products. The work concludes with an interesting note on three recent uses of milk: (1) in the form of dried cubes; (2) as an ingredient of a cement for ships' tanks; (3) in Italy as a source of artificial wool.

MALIGNANT TUMOURS OF THE NOSE AND NASAL ACCESSORY CAVITIES

Maligne Tumoren Van de Neus en Neusbijholten. By Hermanus Claassens Wykerd. (Pp. 148; illustrated.) Groningen: J. B. Wolters Uitgevers-Maatschappij. 1937.

His thesis for the degree of doctor of medicine of the University of Groningen, on malignant tumours of the nose and nasal accessory cavities, has been published in book form by Dr. Hermanus Wykerd. The thesis is written in Dutch, so that the text is not available for most English readers, but there is an excellent summary of seven pages and a good bibliography. The author draws attention to the remarkable frequency with which squamous-celled carcinoma occurs in a region covered with columnar epithelium It is claimed that the majority of malignant tumours originate in the antrum. This is based on thirty-five cases observed at Groningen. There were twenty-five cases of carcinoma and ten cases of sarcoma. The antrum of Highmore was the seat of origin of the tumour in twenty-two cases, the nasal cavity proper in six cases, the frontal sinus in five cases, the sphenoidal sinus in one case, and the nasal septum in one case. This distribution is very different from the usual experience, which would give a high place to the ethmoid, not mentioned in this series.

The cases have been carefully studied both pathologically and clinically and the conclusions follow fairly closely those reached by Öhngren at Stockholm. Five of the patients are alive, free from recurrence for three and a half to eleven years. There are some interesting photomicrographs showing how Paget's disease, epulis, and osteitis fibrosa all produce a similar growth in the nose, resembling giant-celled sarcoma. As a special study the thesis forms a useful work of reference on numerous points.

Notes on Books

A second edition of *The Evolution of the Endurance, Speed and Staying Power of the Racehorse*, by Dr. W. J. STEWART MCKAY, has been published at 7s. 6d. by Hutchinson and Co., London. In addition to his eminence on the Australian turf the author has many publications on agriculture, zoology, veterinary medicine, and human surgery in his name. A history of the evolution of the racehorse, occupying the first half of the book, apparently leads Dr. McKay to the conclusion that in the great majority of cases the staying power of the racehorse is inherited from the sire. In the second half Dr. McKay reveals how long observation on the course, intimacy with racing records and stud books, and gleanings from physiology have convinced him that the failure of a horse in its races is due to cardiac insufficiency. Though his medical and veterinary colleagues may search in vain for the measurements of racehorses during life and after death, supporting the author's "heart theory of staying power," they may be thrilled with the chapter explaining how to follow form and spot the winners. Obtaining such information direct from the horse's mouth, the sportsmen and trainers, for whom the book is intended, will revel in the author's description of the genes, hormones, cardiac outputs, and other queer things in their bloodstock. Thus the book provides something for everybody.

A second edition of Dr. GLADYS M. COX'S *Clinical Contraception*, with an introduction by Lord Horder, has been published by W. Heinemann (Medical Books), Ltd., at 7s. 6d. This book was written in the first instance at the suggestion of the National Birth Control Association. The new edition emphasizes the author's conviction "that the use of a *combination* of a chemical and a mechanical contraceptive, selected for the individual patient, gives the greatest possible security against conception. The claims made by the manufacturers and distributors of the absolute reliability of certain chemical contraceptives cannot be substantiated clinically."

The richly documented work on *La Tosse* (Palermo: L. Salpietra, 30 lire), by Dr. ANTONINO CULOTTA, assistant to the Institute of Morbid Anatomy of Palermo University, is, as its subtitle indicates, divided into three parts, devoted respectively to the physiopathology, clinical aspects, and treatment of this distressing symptom. In the clinical section cough is considered first as a symptom of respiratory disease, and secondly as a manifestation of disorders of the digestion, cardiovascular, and nervous systems, diseases of the lung and kidneys, and acute infections. A bibliography of 173 references is appended.

Preparations and Appliances

"P.B.A.S."

P.B.A.S. (Hewlett's) is a preparation of para-amino-benzene sulphonamide. This relatively simple compound has been shown to be a valuable agent in the prevention and cure of infections with haemolytic streptococci. This important chemotherapeutic advance has aroused general interest, and reports on the action of the compound continue to be very favourable. P.B.A.S. is made up in tablets of 0.5 gramme for oral administration. The curative dose recommended is six to nine tablets daily and the prophylactic dose two to six tablets daily.

"ANTOSTAB"

Messrs. Boots have issued a brochure describing the nature and uses of their preparation antostab. This is a preparation of gonadotropic hormones obtained from the serum of pregnant mares. Its activity is standardized biologically by measurement of its action on the ovaries of infantile mice. The preparation is issued in powder form and must be dissolved just before use. This method is necessary because the gonadotropic hormones do not keep well in solution. Antostab is recommended for the treatment of amenorrhoea and of scanty menstruation. Copies of the brochure are available for the medical profession on application to Messrs. Boots Pure Drug Co. Ltd., Station Street, Nottingham.

SYNTHETIC CRYSTALLINE ANEURINE

Benerva brand of Vitamin B_1 (Roche Products Ltd., 51, Bowes Road, N.13) is a preparation of synthetic crystalline aneurine. It is prepared for oral administration in tablets each containing 1 mg. of the vitamin (500 international units). It is also prepared in 1 c.cm. ampoules for parenteral administration. Each ampoule contains 2 mg. (1,000 international units) of the vitamin.

Recent research has indicated that certain forms of neuritis are due to derangements of alimentary functions preventing absorption of vitamin B_1 from the gut. Hence the parenteral administration of this vitamin appears to be an important new form of therapy for certain diseases. Messrs. Roche have prepared useful brochures describing recent clinical results obtained with vitamin B_1.

MILITARY MEDICINE AND PHARMACY

NINTH INTERNATIONAL CONGRESS

A prominent feature of the ninth International Congress of Military Medicine and Pharmacy, held in Bucharest last month, was the general acknowledgement of the practical progress which had been made in reaching agreements designed to reduce the horrors of war as far as possible. Among the 1,400 members of the Congress were official delegates from thirty-one countries and national organizations, and it was decided that the standing committee should be modified so as to comprise representatives of the seven founder countries, together with representatives of the countries which had organized previous international congresses or had applied for membership, and a general secretariat established in Belgium. The modified rules would be submitted to all the Governments concerned, and the executive bureau would come into being in 1938 in connexion with the meeting in that year of the standing committee in the United States of America.

Sectional Proceedings

Six sections of the recent Congress dealt with different topics. In respect of the organization and functioning of the medical services in combined military and naval activities it was decided that attention must be paid both to offensive and defensive operations, and a plan be defined beforehand. Co-operation between the two services should be maintained by the establishment of a single command, the evacuation measures as regards naval vessels being under the protection of the Hague Convention. In all combined military and naval operations there should be a medical base working primarily in conjunction with hospital ships and secondly with depots on land. The unification under a single command of these military and naval depots would facilitate the co-ordination of relief measures on land. Considerable advantages would accrue from the designation of certain towns and maritime centres as depots for receiving the sick and wounded, and a plan has been drawn up providing for these in an international agreement. Another section concerned with gas cases concluded that questions of transport, hospitalization, and treatment were necessarily governed by the nature and the degree of the lesions. Transport presented no special problems, but hospitalization would depend on whether the primary concern was to be surgical or the treatment of gas casualties. Since surgical treatment demanded greater specialization of personnel and equipment, it was agreed that it would be better to establish surgical depots provided with gas sections. If, however, the proportion of gas casualties was very high, the creation of special centres for their treatment would have to be contemplated. The work of detoxication belonged more properly to health services, which would deal both with prophylaxis and with treatment.

A third section reviewed the organization and functioning of the special surgical work required for mechanized units in warfare. These would often be operating independently of the main forces, and the medical services attached to them would have to be endowed with rapidity of movement, be well equipped and provisioned, and capable of functioning independently also. The main purpose of these medical units would be the swift evacuation of the wounded towards the base, because surgical treatment was particularly difficult to arrange for the personnel of quickly moving troops; it would have to be restricted to the most urgent cases, but in unfavourable tactical conditions the work of the medical units would be limited to mass evacuation to special clearing stations. This called for new developments in the organization of evacuation work generally, and the staffs of these quickly moving units would have to be better informed than others so that they might adjust themselves to the rapidly changing needs of very mobile warfare.

The fourth section of the Congress dealt with the employment of colorimetric methods in field laboratories. Dental questions were considered by the fifth section, and it was agreed that partial or complete loss of teeth did not constitute grounds for exemption from military service if dentures proved satisfactory in respect of securing maintenance of the general health and fitness for military duties. The treatment of choice in peace time would be the supply of suitable dentures after the buccal cavity had been rendered healthy by the removal of septic foci of dental origin. In wartime there would have to be facilities for making and repairing dentures in the war zone, for as a general rule there should be no question of evacuating dental cases.

The sixth section dealt with problems relating to the supply of food and the appropriate dietetic treatment of the sick and wounded in wartime. While it was impossible to standardize rations, some scheme of classification was thought advisable, due regard being paid to the economic resources of various countries and especially to national dietetic customs. The feeding of the sick and wounded would necessarily improve as the result of scientific progress, and modern researches in the field of alimentation would play a considerable part in the identification of the more protective foods. In cooking and feeding establishments corresponding benefits would accrue from new discoveries, and gas and electricity would be more extensively used in cooking as well as in cold storage. It might be necessary to establish schools of cookery with a view to limiting the preparation of food to trained and professional chefs. Similarly in hospitals special kitchen departments should be instituted to secure that the dietetic requirements of different classes of the sick and wounded could be met, including the service of the meals in palatable form.

Plenary Session

These various recommendations were embodied in a final recommendation by the Congress as a whole, special emphasis being laid on the importance of securing and safeguarding towns and other centres for medical and health purposes. The advances already made in respect of the various humanizing possibilities pointed to still further progress in the near future, and it was hoped that an international convention would be established to embody all the recommendations envisaged by the various sections of the Congress, humanitarian considerations being accorded primary place henceforth. An invitation by the United States Ambassador to hold the next Congress in Washington in 1939 was unanimously accepted, and thus for the first time the place of meeting would be outside the confines of Europe. General Iliesco would consequently be succeeded as president by Colonel H. W. Jones, leader of the United States delegation. The subjects for discussion then would be: the organization and function of the medical services in colonial warfare (introduced by Italy and the United States); preliminary estimation of the numbers of casualties in war and consideration of the preparation necessary for their treatment (introduced by Germany and the United States); practical methods of anaesthesia and analgesia in military surgery (introduced by Argentina and Czechoslovakia); emergency treatment of and the equipment necessary for maxillary fractures due to war weapons (introduced by France and the United States); and the technical specialization of the administrative officers required for military medicine and surgery (introduced by Mexico and the United States). The exceptional success of the social side of the Congress in Bucarest was gratefuly acknowledged, and keen appreciation was expressed of the services rendered in this respect by King Carol and the Rumanian Government.

The speech by Viscount Astor in the House of Lords on May 5 on the nutrition problem has now been published in a revised form, and includes points made in his reply to the debate. It is particularly commended to social workers, and may be obtained from the National Temperance League, 33, Bedford Place, Russell Square, W.C.1.

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THE BELFAST MEETING

There is a part of Antrim where fairies can be seen by those gifted with unusually good sight, and it is rumoured that several members, well primed with vitamin A to avert night blindness, went in search of them, but unsuccessfully. But these investigators did not allow for a number of factors. Their craving for knowledge was not tempered with scientific caution. A moment's reflection would have informed them that all the fairies in the North of Ireland had been mobilized in Belfast for the Annual Meeting of the British Medical Association. Every Annual Meeting, of course, is a success. If it were not so meetings would not be held annually. A democratic organization such as the British Medical Association is cemented by the unanimity of its members on certain matters of fundamental importance, such as, dare we say, the usefulness of this *Journal*. Among these matters the Annual Meeting is one, and, while not in any way disparaging previous meetings, we agree with the member who remarked that Belfast was an "unqualified" success—by which he meant that he had never enjoyed himself so much before. Irish hospitality and Irish charm made each person feel so much at home that when the time came to leave he parted with regret and "sweet sorrow." The truly Irish qualities of hospitality and charm were epitomized in the President, Professor R. J. Johnstone, whose easy courtesy and unassuming friendliness endeared him to everyone who came into contact with him on private or on public occasions. It was a disappointment to all, and not least to Mrs. Johnstone herself, that illness prevented her from fully enjoying the results of the hard work she had put in as wife of the President. Seldom have the ladies been so well looked after at an Annual Meeting, and many of them will treasure as a memento of the occasion the ladies' handbook bound in Irish linen. It is not possible here to mention by name all those who helped the President to make the Meeting of 1937 the success it was, but special tribute must be paid to the Local General Secretary, Dr. F. M. B. Allen, and his second in command, Dr. R. W. M. Strain. The organization of an Annual Meeting has now become a formidable task, so formidable that the Representative Body considered the question of appointing a whole-time secretary for this purpose. The Belfast Meeting went off without a hitch. So perfectly had the work of organization been carried out, and so complete was the absence of fuss, that few people were aware that the Meeting was being moved by a complex piece of machinery. The grateful thanks of the Association are also due to the civic authorities, who aided and abetted their medical friends at every turn. The Lord Mayor of Belfast, whose reception at the City Hall will long be remembered, worthily maintained the reputation of his city for hospitality.

Although gaiety suffuses the Irish air, however damp this may be, time was, as is customary, set aside for serious matters. Debate at the Annual Representative Meeting was at times not so keen as in former years. Whether the representatives were lulled into quiescence by the genial good nature of the retiring Chairman, Mr. H. S. Souttar, or whether they missed the stimulus of that master of debate, Sir Henry Brackenbury, we do not know. They were at all events meeting in a city not averse to controversy. At an early stage in the proceedings the representatives began seriously to consider whether they were really representative or not, and discussed at great length a proposal that a general practitioners committee be formed, whose "duties and powers would be to consider matters specially affecting general practitioners." Those who spoke in favour of the motion were pleasantly oblivious of the humour of the situation. After all, the great majority of the members of the Association are in general practice, and the B.M.A. consists of its members—it does not exist *in vacuo*. The proportion of general practitioners is also well maintained in the Representative Body, which determines by vote the policy of the Association. What could be more representative than this? The fundamental error is in looking upon the interests of one section of the profession as distinct from and opposed to those of another. The B.M.A. must, and indeed does, concern itself with the interests and activities of all branches of medical practice, for medicine is one profession, not many. Of greater relevance was the discussion on maternity services, and readers of the *Journal* will endorse the resolution "that the Representative Body views with growing anxiety the tendency to divert from the general practitioner the practice of midwifery

and its associated ante-natal work." There was no doubt that that wise medical statesman Sir Kaye Le Fleming had well weighed his words when he described the difficulty as "the taking of a purely medical question into the political arena until the politician was driven to do something for political reasons, and . . . the absence of a proper means of approach by the local medical profession to the local authority."

Strangely enough few people found themselves able to agree with the *Times* leader writer, who on Tuesday, July 20, described the Belfast programme as "old-fashioned, musty, even threadbare." As the Scientific Sections did not begin until Wednesday, July 21, no one, however omniscient, could have foretold the nature of the discussions on subjects of which he may or may not have had expert knowledge. And the value of the Scientific Sections lies chiefly in the free discussions that take place on subjects which, old and new, are relevant to the daily practice of medicine. To the visionary, no doubt, such matters as "individual variations in response to drugs," "tomography," "protamine insulin," "the use of vitamin E in habitual abortion," are all threadbare and even musty subjects. Nevertheless unusual interest was shown in these and other matters on the scientific programme, and the level of discussion was considered to be unusually high. The report of the British Medical Association Committee on Physical Education—the basis of much public discussion and activity since its publication in April, 1936—might have been circulated to those attending the Section meetings to remind them of what they already knew: in the maintenance of health many factors enter, of which physical activity is but one. Those who arranged the scientific programme were also well aware that a body that is ill fed needs rest and nourishment and not the "physical action" lauded in the *Times* leading article. The medical profession is rightly less concerned with "the glamour of action beyond the normal level" than with seeing that the normal level is maintained: proper nutrition, good working conditions, adequate housing, and recreation are necessary for this. When these have been obtained, then will be the time for studying "the glamour of action."

We cannot conclude this brief review of the Belfast Meeting without reference to the enthusiastic reception given to Major-General William MacArthur's popular lecture on "Insects and Disease." The meeting ended as it began, in a spirit of real friendliness and comradeship. Those who had visited Ulster for the first time left with the firm resolve to return at the earliest opportunity —an opportunity which is not to be missed.

SPINAL TUMOURS: A JUBILEE

There are few surgical experiences more satisfying than that of seeing a paralysed, bed-ridden, and incontinent patient restored to health and normal life as a result of the diagnosis, localization, and successful removal of a spinal tumour. Just over fifty years ago it was Sir Victor Horsley's privilege to be the first to have this gratifying experience, and to some the event is more memorable even than Sir Rickman Godlee's operation for a cerebral glioma, of which the half-centenary was celebrated three years ago by a dinner and appropriate references to the occasion on the part of some of the chief guests. Although brain tumours are six times as common as spinal cord tumours, the latter are just as remorseless if not prevented from producing a steadily progressive destruction of the cord by compression. It is well known that once complete destruction of a section of the human spinal cord has taken place it does not regenerate. The recognition and removal of spinal tumours before such destruction of the cord has come about is therefore of the utmost importance. It is surprising, however, to what an extent the cord may be compressed by a tumour and yet recover its function after operation. We have now almost daily evidence of this in the successful recovery from paraplegia of patients with spinal tumour, in many of whom at the time of operation the cord has been found to be extensively compressed.[1]

On the afternoon of June 9, 1887, at the National Hospital, Queen Square, Victor Horsley performed laminectomy on an Army officer, aged 42, who had suffered from severe pain below the inferior angle of the left scapula for three years and who had spastic paraplegia in extension. Sir William Gowers, in whose care the patient had been, diagnosed a spinal tumour and advised operation, and in this Sir William Jenner, who also saw the patient, had concurred. Throughout the operation the carbolic spray was used and instruments and sponges were immersed in 5 per cent. carbolic lotion. No tumour was found, and the operation was about to be concluded when the late Sir Charles Ballance,[2] who was assisting, urged Horsley to go higher. In his report of the case Horsley[3] remarks: "I removed another lamina at the upper part of the incision. On opening the dura mater I saw on the left side of the subdural cavity a round, dark, bluish mass about three millimetres in diameter, resting upon the left lateral column and posterior root zone of the spinal cord. I recognized it at once to be the lower end of a new growth and therefore quickly cut away the major part

[1] *Lancet*, 1935, **1**, 187.
[2] *British Medical Journal*, 1936, **1**, 1005.
[3] *Med. chir. Trans.*, 1888, **71**, 377.

of the lamina next above. This enabled me to see almost the whole extent of the tumour when the dura was divided." This tumour, the first ever to be diagnosed and successfully removed from the living subject, is specimen 5063–1 in the Hunterian Museum of the Royal College of Surgeons of England. It is interesting to note that although the cord was swabbed with 5 per cent. phenol and the patient had a cerebro-spinal fluid fistula for six weeks he made an astonishingly complete recovery, and a year after the operation wrote to Horsley that he was in excellent health and working sixteen hours a day. Horsley was so far ahead of his time that ten years elapsed before an equally successful result was obtained in a case of Harvey Cushing's,[1] not reported until 1904.

The case operated upon at Queen Square fifty years ago marks a great original effort, and in thinking of those pioneers in the surgery of the spinal cord we are reminded of the lines from Coleridge's *Ancient Mariner*: "We were the first that ever burst into that silent sea." Only six years before Horsley's highly successful operation Herbert Page of Newcastle-on-Tyne had described laminectomy as "an operation not within the range of practical surgery," and when Horsley published this case he collected records of fifty-eight other patients untreated by operation, all of whom had died. It is fitting that we should be honouring, at least by reference to it, the half-centenary of Horsley's spinal tumour case, for as the late Donald Armour once said (Lettsomian Lectures, 1927), this epoch-making occasion proved to be the birth of spinal tumour surgery.

[1] *Ann. of Surg.*, 1925, **85**, 223.

THE PATHOLOGICAL MUSEUM AT BELFAST

It may safely be said that no more instructive collection of pathological material has been exhibited at an Annual Meeting of the British Medical Association than that shown at Belfast. The greater part of it consisted of specimens which have been collected for teaching purposes under the direction of Professor Young during the past few years. The material was admirably chosen either to illustrate typical disease processes or to exemplify unusual abnormalities. Not only were the specimens themselves well mounted and displayed, but the presentation of clinical data connected with them was admirable, and frequently included reproductions of skiagrams taken during life and other such illustrations of the case other than the specimen itself. The more closely the pathological process can be related to clinical symptoms and signs the better will it be understood by the student and the greater his gain from pathological teaching. An unusual feature was the demonstration on viewing screens of large histological sections: one group of these was devoted to breast tumours, in which it was instructive to be able to see at a glance the situation and extent of a growth and the direction of its spread. On another were a variety of similar specimens, including several sections through the entire uterus in cancer at various stages; these beautiful preparations afforded a picture of what may be called the anatomy of a disease which is quite unattainable by other means. Perhaps the most striking specimens in the general collection were those illustrating malignant disease of the lung, of which many types were represented; there was also a varied series of tumours of the brain. Several special exhibits were devoted to tumours of bone, a subject which was discussed by the combined Sections of Pathology and Radiology on July 22; many of the specimens shown were from cases referred to by speakers at that meeting. Professor M. J. Stewart exhibited specimens illustrating the fact that giant-celled tumours of bone include a type which may metastasize, and examples of the solitary plasmocytoma, a tumour which may present considerable difficulty in diagnosis and is, indeed, still imperfectly recognized. Examples of plasma cell tumours were also shown by Professor D. F. Cappell and Dr. L. M. Hawksley. Among other exhibits were a demonstration by Sir Thomas Houston on types of enterococci, by Dr. Eileen Bartley and Dr. N. C. Graham on the cultural disturbances between Lancefield's groups of haemolytic streptococci, and by Professor C. C. Macklin on experimental pneumothorax. It should be added that in connexion with the morbid anatomical exhibits histological sections of every specimen were provided, together with plenty of microscopes by which they could be examined. Many visitors must have felt that had the programme of the meeting not been so full they could profitably have spent a much longer time than they did in studying this excellent collection.

A NEW TREATMENT FOR DIABETIC KETOSIS

Professor Szent-Györgyi has just given an account of a new treatment for diabetic ketosis, producing evidence that the administration of succinic (amber) acid by mouth quickly removes acetone bodies from the urine. Rumours of this treatment had appeared in the British lay press even before his scientific publication[1] in Germany. The idea is revolutionary, and coming from such a source commands serious attention. It is suggested that injections of insulin may be replaced by succinic acid by mouth in the treatment of patients even with severe ketosis. Szent-Györgyi's idea is based on the theory he has previously advanced, which is by no means generally accepted, of the vital part played by C_4 dicarboxylic acids, especially pyruvic acid, in tissue respiration and intermediate carbohydrate metabolism. This led him to think that the C_4 succinic acid might help as a catalyst in the disordered metabolism of diabetes, particularly the ketone disturbance. Five cases of diabetic ketosis have been treated by succinic

[1] Korányi, A., and v. Szent-Györgyi, A. (1937). *Dtschr. med. Wschr.*, **63**, 1029.

acid, and according to the published account successful results were obtained in four of them. The first case is the most striking. After the omission of 70 units of insulin a day the administration of 10 grammes of succinic acid by mouth completely removed a heavy urinary ketosis in four days, although the hyperglycaemia and glycosuria remained unchanged. The succinic acid was then stopped, and the ketosis recurred, to disappear again two days after restarting the acid. This procedure of omitting and restarting the treatment was repeated, with the same result, and the patient was ultimately controlled with 1 gramme of succinic acid and 10 units of insulin daily. The results lead the authors to suggest that injections of insulin may be replaced by succinic acid by mouth, a matter of enormous importance to thousands of patients with diabetes. In the current issue of the *Journal* Dr. R. D. Lawrence and his colleagues publish on page 214 a short report of their preliminary trial of the succinic acid treatment, describing entirely different and negative results. Two women with heavy ketosis were given 10 grammes of succinic acid for a week, during which time the ketosis grew steadily worse, to disappear rapidly later under insulin treatment. These workers are satisfied that the experimental conditions were well controlled, and their results are definite. There is, therefore, a complete contradiction in the results of two groups of workers, neither of whom have studied many cases. It is clear that many more cases must be followed under strictly controlled conditions and by other observers, and the changes in ketosis must be studied by qualitative estimations as well as by qualitative tests. It may be that succinic acid acts in some but not in all cases of diabetic ketosis, as it seems likely that there is more than one type of diabetes. At all events it is too soon to advise the general use of succinic acid in place of insulin; from Dr. Lawrence's experience it is evident that this would in certain cases involve the risk of diabetic coma.

"JOURNAL OF NEUROLOGY AND PSYCHIATRY"

Since 1926 the *Journal of Neurology and Psychopathology* has been issued four times a year by the British Medical Association, and the 68th number appeared in April, 1937. The contents have included original communications and editorial articles, together with abstracts of current neuro-psychiatric literature and critical reviews. Until his much-regretted death on May 12 Dr. S. A. Kinnier Wilson, with the assistance of an Editorial Committee, edited the journal, and under his guidance it established itself as one of the foremost periodicals for the record of progress in the branches of medicine with which it deals, its scope and arrangement giving it a place which no other journal published in English exactly copies. The position created by Dr. Wilson's death was fully considered by the Editorial Committee and the following decisions were made. No further issues will be published this year. The next, No. 69, will appear in January, 1938, under the editorship of Dr. E. A. Carmichael, with its title changed to *Journal of Neurology and Psychiatry*. The accounts of subscribers will be adjusted to make up for the temporary suspension of publication. All communications on editorial matters should be addressed to Dr. Carmichael, National Hospital, Queen Square, London, W.C.1, and on business matters, to the Secretary of the Journal Board, B.M.A. House, Tavistock Square, W.C.1. Under the new printing arrangements the size of page will be larger. The cost is 25s. per annum (20s. to members of the British Medical Association); single numbers 7s. 6d. post free.

FOOD-POISONING DUE TO MILK

At this time of year there commonly arise cases of acute enteritis for which a cause can rarely be found. Living bacteria of the Salmonella group are readily identified, but they account for only a small proportion of food-poisoning outbreaks, and when their presence has been excluded the remaining possibilities are less amenable to investigation, and indeed usually remain in the field of conjecture. That the multiplication in food of other less specific bacteria may have similar effects is undoubted, although to attribute a given case to the activities of a particular micro-organism may be a matter of great difficulty. Within the past few years, however, another specific type of food-poisoning has been identified among these miscellaneous cases. This type is due to the formation of a toxin in food by the growth of *Staphylococcus aureus*; it may be suspected when the incriminated food contains this micro-organism in considerable numbers, but proof is only obtainable by the administration of culture filtrates to human volunteers. It is still doubtful whether any character other than the capacity to form this enterotoxin can be used to distinguish the true food-poisoning strains of staphylococci. Simpler cultural tests have been proposed, but it now appears that the administration of filtrates to monkeys, which was at first thought to be a satisfactory test for staphylococcus enterotoxin, is not reliable enough. It may be remarked in passing that this is the only fully identified exotoxin with a local action on the alimentary tract, just as the toxin of *Cl. botulinum* is the only toxin which can be absorbed there. The literature of this form of food-poisoning is almost entirely transatlantic, and it is not clear whether the condition is actually commoner in America or whether its existence in this country, for instance, is still largely unrecognized. Although a variety of articles of food have been known to cause this form of food-poisoning, milk, milk products such as custard, and confectionery containing cream have most often been responsible. Shaughnessy and Grubb[1] have recently described the investigation of outbreaks due to milk itself, and it was found in each case that the herds supplying the milk included cows with staphylococcal mastitis. This is important evidence pointing to a distinct origin of this type of contamination, and suggesting that only certain strains which are pathogenic to the cow can be responsible; staphylococci, after all, are so ubiquitous that any chance contamination cannot be deemed capable of causing this form of food-poisoning. Brooks and Tiedeman,[2] in a general discussion of the relation of

[1] *Canad. publ. Hlth. J.*, 1937, **28**, 229.
[2] *Amer. J. publ. Hlth.*, 1937, **27**, 334.

bovine mastitis to human disease, also refer to staphylococcal infection of the udder as a cause of gastro-enteritis in man. This is clearly a possibility which should be borne in mind in investigating outbreaks of food-poisoning, even though the ultimate proof of their staphylococcal origin may present insuperable difficulties until some more convenient test for this enterotoxin has been devised. These discoveries throw an interesting retrospective light on the summer diarrhoea of infants. It has long been suspected that various bacteria, other than the recognized intestinal pathogens, by multiplying in milk can produce substances which will act as irritants in the alimentary tract. Here is the fullest possible proof that a micro-organism, the presence of which would otherwise be disregarded, can form a toxin which will cause vomiting, diarrhoea, and collapse even in the adult. How many of the multitudes of infants who used to die of gastro-enteritis were suffering from food-poisoning due to staphylococci, or perhaps other bacteria acting similarly, will never be known. There is every reason for supposing that pasteurization and fewer house-flies have been responsible for the enormous reduction in frequency of this disease. In such cases as do occur nowadays a series of examinations of the milk consumed, with particular reference to its coccal content, might have illuminating results.

LE DROIT DES SAVANTS

On June 8 one more step was taken in the direction of giving scientists material rewards for their discoveries when the French Academy of Medicine passed a resolution in favour of this principle. During the past decade this problem has appeared from time to time on the agenda of scientific and allied bodies, including the League of Nations and its offspring the International Institute of Intellectual Co-operation. In a report presented on behalf of the Commission of Intellectual Co-operation, Bergson maintained that in the scientific field a new idea, not only its application, deserved protection on behalf of its author. Last March a study of the rights of savants was presented to the Academy of Medicine by Paul Olagnier. The commission, which was appointed by the Academy, and which was composed of some of its most distinguished members, has now issued its report, and it was as a response to this report that the Academy on June 8 unanimously voted a resolution in which the Government was invited to submit to Parliament the draft of a law aiming at the preservation of the rights, moral and material, of savants and inventors in all the fields in which their discoveries and scientific inventions exist. In the preamble to this resolution it was noted that legislature as it now stands does not grant to savants the same rights with regard to their discoveries and inventions as those enjoyed by the authors of literary and artistic works. It has seemed for some time that the discussion of this subject by learned societies has inevitably been doomed to the futility of pious wishes lacking executive expression; but what has given rise to hopes that this problem may be transferred from the academic to the legislative plane is that the French Government has prepared the draft of a law amplifying and harmonizing already existing legislation concerning authors' rights. With good will it ought not to be difficult to couple these proposed reforms with clauses extending the rights of authors to scientists in Bergson's spirit.

LESTER INSTITUTE, SHANGHAI

The annual report for 1936 of the Henry Lester Institute of Medical Research, Shanghai, is as interesting as its predecessor. This institution is notable for the close liaison it facilitates between its workers and centres of research in Europe, and for the catholic range of its local activities and their practical application. Further field investigations have been conducted with regard to schistosomiasis. During the summer months a party of some sixty Russian boy scouts were encamped in the hills twenty miles south-west of Shanghai, and on their return to the city many of the boys were found to be infected with the disease. The Institute immediately despatched investigators to the district, where numbers of infected snails were discovered. Monthly visits were initiated to study the bionomics of *Oncomelania*, an essential prelude to the control of the disease in an endemic area. The report stresses the danger of bathing in creeks or ponds within a hundred miles of Shanghai. A considerable incidence of infection with *S. japonicum* was found in the cattle slaughtered in the municipal abattoirs. The livers of 156 oxen and 140 water buffaloes were examined for the ova; in one series of oxen 33 per cent. were infected and 23 per cent. in a series of water buffaloes. The study indicates that cattle may serve as an important reservoir host of schistosomiasis in China, although it is pointed out that transmission cannot be direct, the snails constituting a necessary intermediate host for the development of the Cercariae. The report records the retirement of Dr. J. L. Maxwell, one of the founders of the Institute, and interesting extracts are quoted from his valedictory lecture. When Dr. Maxwell went to China thirty-six years ago typhoid cases, which at that time still laid a heavy burden on the medical wards of St. Bartholomew's, were very infrequent among the Chinese in Amoy, then reputed one of the dirtiest cities in China. Amoy is now one of the finest cities of the Far East, with an unrivalled supply of pure water. Nevertheless, typhoid is to-day one of the main causes of Chinese admissions to its hospitals, and takes the leading place in the mortality rate. In short, the disease has enormously increased in circumstances which would have been expected to produce the opposite effect. Dr. Maxwell also mentions the great increase in neurosyphilis. He attributes the spread of syphilis in country districts to the ubiquitous wanderings of a licentious soldiery during the last twenty-five years, and infers that the unaccustomed nerve strain engendered by wholesale brigandage has concentrated the ravages of the disease on the central nervous system. With regard to the future of medical research in China, Dr. Maxwell stresses the need for team work. He also points out that, though increasing attention is paid to physical health, especially with regard to nutrition, the question of mental health and also of spiritual health is comparatively neglected.

ANAESTHESIA IN GENERAL PRACTICE

This is one of a series of articles, contributed by invitation

NOTES ON THE PHYSIOLOGY AND PHARMACOLOGY OF ANAESTHESIA

BY

H. W. FEATHERSTONE, M.A., M.D., D.A.

General surgical anaesthesia may be defined as the state of profound insensibility produced by the action of certain drugs on nerve cells of the brain without harming the essential processes of respiration and circulation, and sufficiently profound to allow a surgical operation to be performed. Local anaesthesia comprises loss of sensation over an area caused by a drug acting directly on nervous tissue to which it has been applied. It is the purpose of this article to discuss from a practical point of view the various routes by which these drugs enter the body, the effects they produce, and their ultimate fate.

General anaesthetics are administered in the gaseous or in the liquid state. Solid drugs are given in solution.

Volatile Anaesthetics

Gaseous anaesthetics which enter the body through the lungs are called inhalational anaesthetics. This group includes nitrous oxide, ethylene, acetylene, and cyclopropane, and the vapours of di-ethyl ether, divinyl ether, chloroform, and ethyl chloride. Since an inhalational anaesthetic is speedily absorbed and excreted by the blood through the alveolar epithelium the drug may be given with safety in full pharmacological dose to the point of deep surgical anaesthesia, and provided respiration and circulation are maintained reduction in dosage can be effected readily. On the other hand the dose of non-volatile anaesthetics cannot be reduced rapidly, and therefore deep anaesthesia is not compatible with safety. If a volatile anaesthetic such as ether is administered in solution either intravenously or by the rectum the drug will be excreted by the lungs.

In the upper air passages certain direct effects may be produced: irritation of the mucous membrane accompanied by vasodilatation, secretion of mucus, muscular spasm; after some minutes these signs of irritation may be followed by local anaesthesia of the walls of the air passages and by muscular relaxation. Ether (in the absence of atropine) is especially prone to cause these events, but chloroform and ethyl chloride are less irritating and nitrous oxide and ethylene are non-irritating.

ABSORPTION AND ELIMINATION

The direction of the diffusion of the vapour through the alveolar epithelium depends upon the partial pressure in the alveoli and the tension in the blood. So long as the partial pressure of the vapour in the air cells is higher than its tension in the blood the drug is absorbed by the blood. Although the alveolar epithelium does not appear to suffer damage during anaesthesia of normal duration, high concentrations of ether or of chloroform acting over a long period may cause more or less permanent injury to these cells. Deep inspiration draws a larger volume of gas into the lungs, and at the same time the increased power of the thoracic "pump" promotes a more rapid flow of blood through the heart and lungs. Therefore by full respiratory movements absorption of anaesthetic gases is increased; or after the administration has ceased excretion of the drug is encouraged.

In the blood the drug is carried partly in solution in the plasma and partly in the red corpuscles, either in a loose chemical combination or by adsorption. After passing through the left heart the anaesthetic-laden blood is propelled to the brain and to the tissues of the body. It is common experience that for a particular anaesthetic the longer the duration of administration the more the delay in recovering consciousness. Brief administration produces a certain tension of the gas in the blood, but the lymph and the body tissues generally do not have sufficient time to store up the drug. On the other hand prolonged anaesthesia causes the anaesthetic to accumulate in all the tissues, although it is necessary to prolong administration for several hours before the concentration in the arterial blood, the venous blood, and the tissues is in equilibrium.

McKesson introduced the method of administering nitrous oxide and oxygen, which he termed "secondary saturation." One hundred per cent. of nitrous oxide is inhaled until the patient is grey, and therefore the blood contains a maximum tension of nitrous oxide, which ensures that the tissues in general and the nerve cells in particular rapidly obtain a maximum concentration of the drug. Oxygen is then driven into the lungs (and into the blood), and thereafter a mixture of nitrous oxide and oxygen in the usual proportions is administered. The period of greyness and anoxaemia which accompanies the saturation with nitrous oxide is considered by many anaesthetists to endanger the safety of the heart muscle.

When the administration is stopped elimination proceeds rapidly at first, particularly if the circulatory and respiratory functions are vigorous, and then more gradually. The last traces of the less volatile drugs may be retained for several days. The bulk of an inhalational anaesthetic drug is excreted through the lungs, a detectable amount through the skin, and possibly traces of ether and chloroform are oxidized by the liver and the products excreted by the kidneys.

EFFECT ON THE BLOOD AND THE NERVOUS SYSTEM

All types of general and local anaesthesia produce a leucocytosis, and among other changes in the blood which have been recorded the following may be mentioned: reduction in the amount of haemoglobin, anaemia, haemolysis, prolongation of the coagulation time, increase in the blood cholesterol, reduction of the oxygen content, and an increased percentage of carbon dioxide. These effects are rare with nitrous-oxide-oxygen anaesthesia, but they have been noted with ether and with chloroform. The alkali reserve of the blood is reduced and some degree of ketosis occurs. The glycogen of the liver is mobilized and the blood sugar rises. Undoubtedly these effects are increased by cyanosis, by prolonged anaesthesia, and particularly by chloroform. The administration, before and after operations, of sodium bicarbonate and of glucose (together with insulin, especially in diabetics) is of much service, good oxygenation is essential, and nitrous oxide and oxygen is the least disturbing (but the weakest) anaesthetic agent.

Anaesthetic drugs are not only readily taken up by the blood but nerve cells have a special affinity for them.

The cells in the higher centres of the cerebral hemispheres are affected first, and the centres for the sensory cranial nerves subsequently—smell, then vision, then hearing. Probably oxidation of the nerve cells, upon which the function of the cells depends, is affected by the drug by interference with the selective permeability of the surface membrane of the cells. If the higher centres are very active at the time of induction a higher concentration may be required to inhibit function. This is the rationale of careful pre-operative sedation, either by natural means or by drugs. An individual in a state of mental excitement may require such a large concentration to control the nerve cells of the higher centres that the function of the lower centres may be affected as well. Anaesthetic agents do not affect the various portions of the cerebrum in quite the same order. Thus chloroform and nitrous oxide usually produce analgesia before confusion of the mind and amnesia set in, but ether confuses the mind at the same time as it abolishes pain.

The concentration of a drug in the blood which is necessary to inhibit the activity of a particular group of nerve cells varies with different drugs. At normal atmospheric pressure the greatest partial pressure of nitrous oxide which permits adequate oxygenation will not produce muscular relaxation. In a pressure chamber, working at a pressure of one and a half atmospheres, nitrous oxide becomes more potent. But ethylene is rather more powerful than nitrous oxide, while ether or chloroform will cause muscular relaxation with adequate oxygenation and unimpaired respiratory and circulatory functions.

TOXIC EFFECTS

In the presence of an adequate oxygen supply nitrous oxide, ethylene, and cyclopropane do not impair liver function; but liver function may be diminished by ether for some hours and by chloroform for days. Permanent degeneration, sometimes fatal, occurs in the condition known as delayed chloroform poisoning. The late Dr. Fairlie of Glasgow, with his great experience of chloroform, considered that minor degrees of damage to the liver were not uncommon. Pre-operative loading of the liver with glycogen is a safeguard, and for this purpose glucose or sodium lactate (the liver converts lactic acid into glycogen) may be given for several days before operation.

Anaesthetics affect the heart by poisoning the neuromuscular mechanism and by causing vagal inhibition. In the early stages of chloroform anaesthesia ventricular fibrillation may follow excitement or the injection of adrenaline. Anoxaemia may lead to failure of the heart muscle itself, and this danger may be caused either by complete displacement of the oxygen (for example, by giving 100 per cent. nitrous oxygen in "dental gas" anaesthesia) or by obstruction to the air intake. Inefficient heart action delays induction and recovery. This is clearly demonstrated when giving gas and oxygen to patients with morbus cordis.

Vasomotor control is usually disturbed by the direct action of the anaesthetic upon the vasomotor centre in the medulla. Thus if the head and shoulders are raised compensatory vasoconstriction of the lower parts of the body will not occur and cerebral anaemia may follow. But lowering of the head, as in the Trendelenburg position, is safe and salutary. Nitrous oxide produces slight vasodilatation, and the blood-pressure readings in the absence of shock in ether and in chloroform anaesthesia are instructive. With ether an initial rise in the systolic pressure is followed by a gradual fall, while the diastolic pressure falls steeply at first and remains low until the anaesthetic is stopped, when it usually rises rapidly. Thus the pulse pressure under ether is large, the heart has less work against a lowered peripheral resistance, but cut surfaces tend to bleed more freely. Chloroform anaesthesia is accompanied by a slow fall in the systolic pressure and a rise in the diastolic reading. Therefore the pulse pressure diminishes, the heart works against an increased peripheral resistance, but there is a tendency for the bleeding of cut surfaces to be lessened. It is said that etherized patients bleed at the time of operation, but those who have had chloroform bleed after the operation!

The heat centre is also depressed, and as the metabolism of the body is reduced during anaesthesia the lowering of the body heat may be considerable. Adequate covering of the body, the avoidance of draughts, and a well-warmed theatre are called for.

The function of the kidneys is not demonstrably affected by nitrous oxide and oxygen anaesthesia, but ether and particularly chloroform tend to produce oliguria and anuria. Albumin may be detected in the urine after ether and sometimes after chloroform. Acetonuria was present in 67 per cent. of a series of patients upon whom any one of the various forms of general anaesthesia had been used, and "in no less than 85 per cent. under local analgesia" (Schulze, quoted by Hewer). The blood urea shows a slight rise after ether anaesthesia.

Bourne and Burn have demonstrated that the contractile power of the uterus in labour is inhibited by ether and by chloroform. Nitrous oxide and air or nitrous oxide and oxygen permit uterine activity to continue with normal rhythm and contractile power. Spinal analgesia appears to promote tonic contraction of the circular muscle, but the longitudinal fibres do not function effectively.

Non-volatile Anaesthetics

Among those in common use may be mentioned avertin (tribromethylalcohol) and the rapidly acting barbiturates such as evipan sodium, pentothal sodium (which contains sulphur), pernocton (which contains bromine), sodium amytal, and nembutal. These preparations are all soluble in water, and they are administered by the mouth, by the rectum, by intramuscular injection, or by injection into a vein; but all are not suitable for administration by all routes. Avertin is always administered rectally; evipan sodium and pentothal sodium if injected into the tissues cause severe local reaction, and they are *par excellence* intravenous anaesthetics. If nembutal, the soluble sodium salt of an insoluble barbiturate, is swallowed by a nervous patient the drug may be retained for some time in the stomach by functional pyloric spasm, with the result that the gastric hydrochloric acid may cause precipitation of the insoluble compound and the absorption of the drug may be delayed. Nevertheless nembutal is a useful oral basal anaesthetic.

Each of these substances is detoxicated by the liver, and the oxidized products, together with salts derived from the bromine or sulphur components, are excreted by the kidneys.

The barbiturates not only vary in the particular nerve cells for which they have affinity (luminal has a markedly sedative action in conditions of motor hyperexcitability, such as chorea), but they vary in the rate of detoxication and elimination, sodium amytal being slowly detoxicated, while evipan sodium and pentothal sodium are eliminated with great rapidity. If the property of speedy detoxication is accompanied by a wide margin of safety—that is, if the minimal lethal dose is three or four times the narcotic dose—then the drug may be given into a vein

in sufficient quantity to produce complete narcosis and muscular relaxation. The guide to the dose is the reaction of the patient. Slow administration by other routes—oral, rectal, or intramuscular—is employed for the slowly detoxicated barbiturates and for avertin. The dose is calculated according to the weight of the patient, and unconsciousness only is aimed at, the further depth of anaesthesia being attained by administering a relatively low concentration of an inhalational anaesthetic.

Respiration and the General Circulation

After an operation of average length under either general or spinal anaesthesia there may be marked pallor of the face and body. The prolonged immobility of the body, together with complete muscular relaxation, has reduced the circulation considerably. Deficiency of carbon dioxide (Yandell Henderson) and the reduced metabolism have also tended to produce this appearance.

The administration of carbon dioxide stimulates the respiratory centre and the movements of respiration are increased both in rate and in amplitude. Not only does this improve the colour of the patient by increased ventilation but the return of blood to the heart is also accelerated. On the other hand excess of carbon dioxide may depress the heart muscle. The accumulation of carbon dioxide and other waste products in the muscles tends to cause muscular rigidity.

The administration of oxygen improves the heart's action and helps the functions of other important organs; furthermore, it relieves congestion in the blood vessels of the air passages. Cyanosis after nitrous oxide may lead to vomiting and malaise, but a few breaths of oxygen speedily restore the sensation of well-being. It should be remembered, however, that the pink colour associated with breathing a mixture rich in oxygen may mask defective exhalation of carbon dioxide should the upper air passages or the return flow from an intratracheal catheter be partly obstructed. It is as important to free the body of the waste product carbon dioxide as it is to provide an adequate supply of oxygen. Therefore under general anaesthesia a proper airway is at all times essential.

Local Anaesthetics

These drugs paralyse nerves and nerve endings in concentrations at which they do not injure surrounding tissues and without preliminary excitation. The duration of action is temporary, but more than half an hour (quinine-urea lasts longer and tends to leave permanent effects). They are soluble in water but not destroyed by boiling; they may be combined with adrenaline, and they do not exert a markedly toxic central action. They may be applied by painting on to surfaces; by percutaneous electrolysis; by injection, either hypodermically to paralyse nerve endings or subdurally to paralyse the spinal cord and the spinal nerve roots. These drugs vary in their toxic power upon the brain and other organs, cocaine being potent and novocain relatively innocuous. Adrenaline is injected along with the drug in order that local vasoconstriction and local concentration of the drug may be secured. A large bulk of highly dilute solution increases the tension in the tissues, and thereby pressure paralysis of the nerve fibres is caused.

Patients may suffer discomfort following local anaesthesia. The adrenaline may cause palpitation, pallor, and even alarming derangement of the heart's action. There may be marked idiosyncrasy to the local anaesthetic, and often this effect is not shown immediately but during the few hours subsequent to the injection when, the local vasoconstriction having relaxed, the drug is being dispersed into the circulation. Novocain is rapidly detoxicated by the liver and the products are excreted by the kidneys, but cocaine is detoxicated slowly and excreted slowly.

Spinal Analgesia

By the direct application to the spinal cord of local anaesthetic drugs (tropacocaine, stovaine, novocain, percaine, etc.) the passage of both afferent and efferent impulses along the spinal roots may be blocked, the sensory roots being affected more easily. A solution may tend to diffuse up or down the intrathecal space, and dorsally or ventrally as it is heavier, lighter, or of the same specific gravity as cerebro-spinal fluid—that is, hyperbaric, hypobaric, or isobaric—and as the body is prone, supine, upright, or inverted head downwards. The duration of the analgesia is usually from one to two and a half hours, and the drug is ultimately excreted by the same route as other local anaesthetics.

Not only are the motor and sensory actions of the affected nerve trunks and tracts abolished, but should the thoracic region of the spinal cord be affected extensive vasomotor paralysis ensues. The fall in blood pressure may be considerable. It has been suggested that this fall is due to relaxation of the trunk and lower limb muscles, accompanied by stagnation of blood in the capillaries and veins and increased exudation of lymph. In this way the paralysed region of the body becomes a lake of lymph, while the bulk of blood available for return to the heart is greatly reduced. Should the head be raised and the legs lowered cerebral anaemia may produce syncope. In elderly persons the arterial peripheral resistance may be relatively high. According to the formula $S = 2D - 20$ (systolic should be equal to twice the diastolic pressure minus 20 mm. Hg) a diastolic pressure of 120 mm. Hg requires a systolic pressure of 220 mm., but if a pre-operative diastolic reading of 120 mm. were accompanied by a systolic pressure of only 180 mm. a spinal anaesthetic might cause such lowering of the systolic pressure that serious cerebral anaemia might result.

Headache after spinal analgesia may be severe. It may start a few hours after the administration or the headache may not occur for a week. Usually occipital or sub-occipital, it may be exaggerated by raising the head. The intrathecal pressure is raised and the headache is always relieved, temporarily at least, by lumbar puncture. The headache may follow simple diagnostic lumbar puncture, and although injection of air bubbles, intrathecal bleeding, direct effects of the drug, and other possible causes have been deemed responsible, it is probable that the condition is due to the sudden disturbance of the intrathecal pressure associated with lumbar puncture, with or without the injection of a drug. The application of heat to the feet with ice to the head, accompanied by a saline aperient and a mild analgesic, usually relieves the condition.

When spinal anaesthetics are combined with powerful basal anaesthetics whose elimination depends upon detoxication by the liver undesirable effects may result. The drop in blood pressure is more marked than usual, the respiration often is slowed and reduced in depth. The depression of circulation retards detoxication, and until the effect of the spinal anaesthetic has worn off basal anaesthesia will persist. Stimulation of the respiration and of the circulation by means of inhalations of carbon dioxide and oxygen hastens detoxication and helps to break the vicious circle.

ONE HUNDRED AND FIFTH ANNUAL MEETING
of the
British Medical Association
HELD IN BELFAST, JULY, 1937

THE SECTIONS
SUMMARY OF PROCEEDINGS

During the next few months there will be published in the BRITISH MEDICAL JOURNAL *the opening papers communicated to the Scientific Sections of the Annual Meeting at Belfast. The reports of discussions in this and successive issues are intended to give members who were not present a general idea of the proceedings.*

COMBINED MEETING OF SECTIONS OF MEDICINE AND PATHOLOGY

Wednesday, July 21

The Haemorrhagic States

The president of the Section of Medicine, Professor W. W. D. THOMSON, welcomed members to Belfast, and asked Sir THOMAS HOUSTON, president of the Section of Pathology, Bacteriology, and Immunology, to take the chair.

Professor L. J. WITTS delivered the opening paper on the haemorrhagic states. He said that these conditions did not lend themselves to rigid classification, since the factors causing haemorrhage were complex, but it was convenient to divide them into those in which the blood failed to clot normally and those in which the bleeding time was prolonged. Hereditary haemorrhagic states showed a diversity in their mode of inheritance which had not always been appreciated. In the treatment of haemophilia the local application of coagulant venoms was an important advance, but liver extract, oestrin, and moccasin venom had been failures, and he himself had obtained no results from the Sheffield extract of egg albumen. Idiopathic thrombocytopenic purpura was now a well-defined condition, and splenectomy was the most successful treatment for it, but its *modus operandi* was imperfectly understood and relapse was frequent. Vitamin C was a remedy which had been tried in a variety of haemorrhagic states, but it was of value in scurvy only. The discovery of ascorbic acid had nevertheless been a stimulus leading to further research, and the newly identified vitamins P, K, and T awaited clinical trial. It was important that such trials should be thoroughly carried out on chronic cases, which were more suitable for experiment than acute cases, and that objective criteria obtained by quantitative tests should be used in assessing the value of such remedies.

Dr. N. B. CAPON (Liverpool), discussing haemorrhagic conditions in the newborn, pointed out that spontaneous haemorrhage might occur in infants from a variety of causes, but he wished to confine his remarks chiefly to that condition known as "haemorrhagic disease of the newborn," the onset of which occurred on an average about forty hours after birth. At the Liverpool Maternity Hospital the frequency of this disease was 1 in 405 cases, and his study was based on sixty-three, fifty-eight of which recovered. There was no apparent relation with the sex or weight of the child or with any abnormality in the mother. The aetiology was unknown and the condition so urgent that full haematological investigations were impracticable. In fifty-seven of his cases bleeding occurred only from the alimentary tract, which suggested the possibility of some local cause. A few mild cases appeared to require no treatment; the majority were relieved by the intramuscular injection of whole blood. In severe cases, or if this measure failed, the blood should be given intravenously.

Dr. JANET VAUGHAN reviewed published reports of the treatment of idiopathic thrombocytopenic purpura by various methods. These could be classified under three headings: (1) vitamins (C, P, and T); (2) hormones; (3) miscellaneous remedies. There was no evidence that vitamin C or P had any therapeutic effect, and the influence of vitamin T remained to be proved. The weight of evidence was also against the utility of ovarian extracts, the thyrotropic hormone, parathormone, and liver extract. The claim of Peck and Rosenthal that moccasin snake venom was a specific remedy had not been substantiated in other clinics, and their own results, when carefully examined, appeared far from satisfactory. Divergent results had been reported by careful observers from *x*-ray therapy, and it was suggested that there may be two types of the disease differing in their response to this treatment. Transfusion probably had value only in pre- and post-operative treatment. Representative figures for splenectomized cases were reviewed. The operative mortality for acute cases to-day was 13.6 per cent.; for chronic cases, 7 per cent. Excluding operative fatalities, in a total of 303 patients 217 recovered completely, forty were improved, and eighteen were not benefited. It was suggested that late relapses might be due to the presence of accessory spleens.

Dr. S. C. DYKE (Wolverhampton) spoke on the clinical pathology of haemorrhagic states. The first investigation should be a full blood count, and the collection of blood for this purpose gave also an opportunity of observing the bleeding time. A possible underlying cause was leukaemia, and in some forms of this disease, often accompanied by ulceration of the mouth, abnormal cells did not appear in the blood, which showed only leucopenia and anaemia. Sternal puncture would settle the diagnosis, but was unjustifiable in haemorrhagic states. If there were obviously few platelets in a stained film a platelet count should be done: the result was always under 50,000 in idiopathic thrombocytopenic purpura, and reduced to a less degree in anaphylactoid types, where a history of preceding urticaria or joint pains was also helpful. He preferred White and Lee's method of estimating the coagulation time to Dale and Laidlaw's, since it gave a much greater contrast in results: a time of over fifteen minutes obtained by the former method indicated a liability to severe haemorrhage during operation. He had found minor degrees of scurvy common, as indicated by ascorbic acid secretion, but treatment with this remedy was disappointing.

Dr. R. G. MACFARLANE discussed the mechanism of haemorrhage and haemostasis. It was usually considered that unduly prolonged haemorrhage occurred either when the coagulation time was lengthened or when there was a deficiency of platelets, but it could arise in the absence of either of these abnormalities. He had devised a new form of experiment which threw some light on the mechanism of haemostasis. It was possible to bring a single capillary under microscopical observation and to puncture it with a mechanically controlled needle. Blood escaped for a short time, after which the capillary contracted and remained empty, only refilling with blood three hours later. A rabbit given a powerful anticoagulant such that its blood *in vitro* remained fluid for a week, did not bleed unduly from a cut. He suggested, therefore, that capillary contraction caused the initial arrest of haemorrhage; undue haemorrhage might be primary owing to failure of this contraction, or secondary owing to failure or abnormality of clot formation during the period of contraction. He had treated seven cases of

haemophilia with the extract of egg-white recommended by Dr. Timperley, and had observed no change in the coagulation time except that in one case there was an increase. He disagreed entirely with the hypothesis on which this treatment was based.

Dr. W. A. TIMPERLEY (Sheffield) pointed out that local styptics were of limited value in haemophilia: something was needed which would control internal haemorrhage as well. He and his colleagues claimed that the extract of egg-white prepared by their method reduced the coagulation time and the liability to bleed: seven authentic haemophiliacs had been maintained in good health and free from haemorrhage in spite of a total of forty-one dental extractions, and in one case a street accident involving multiple injuries. The method of preparing the extract had been modified and two active substances identified, one a carbohydrate and one a protein; both were thermostable, but their activity was lost after two or three weeks, and the stored products sometimes came to have the opposite effect to that desired. A single dose should halve the clotting time within twenty-four hours; some samples had this effect within a few minutes. The treatment had to be persisted in, but eventually one dose a week might be enough. He concluded by asking for the indulgence of the profession while further attempts were being made to overcome difficulties in the process of extraction.

Professor G. A. CLARK (Sheffield) gave further particulars of the work described by the previous speaker. He pointed out that there were pitfalls in the method of extraction and suggested that some of those who had sought to repeat the work without success had not escaped these. The extract should be tested on cats for its capacity to reduce clotting time before being given to patients. The extract did not antagonize the action of heparin and did not reduce the clotting time *in vitro*: its action, therefore, must be indirect. Dr. HELEN M. M. MACKAY disagreed with Dr. Capon when he said that slight cases of haemorrhagic disease of the newborn required no treatment. A small haemorrhage might be followed by a very large one, and at the first sign an adequate intramuscular dose (say, 18 c.cm.) of citrated blood should be given at once and repeated in twelve hours. Dr. W. R. F. COLLIS (Dublin) recommended giving 10 c.cm. whole blood at once, repeating this in six hours and transfusing if this did not arrest the haemorrhage. Professor J. W. MCNEE (Glasgow), reverting to the subject of thrombocytopenic purpura, stated that he had examined spleens removed from patients with this condition and found them perfectly normal, not only in size but in microscopic structure. There was therefore no change in the spleen which would explain either the origin of the disease or the beneficial results of splenectomy. Dr. ALAN MONCRIEFF described a case of thrombocytopenic purpura in an infant, occurring at an earlier age than any previously recorded. He questioned the reliability of the tourniquet test for latent scurvy; the two arms might give different results, and the pressure advocated—90 mm.—was too high at least for children. Dr. R. E. STEEN (Dublin) recalled some experiences in which he had tested the possibility of reducing the clotting time in haemophilia: he had found that nothing would do this except whole blood or plasma. Professor S. P. BEDSON considered that the function of the spleen was to remove and destroy effete platelets. Their presence could be demonstrated by tearing out the fresh tissue or in tissue culture, but fixed material was unsuitable for studying the platelet content of the organ. Splenectomy or blockage with india ink caused a rise in the platelet count. Mr. E. R. FLINT (Leeds) maintained that the behaviour of the spleen could not be explained in such simple terms, and described a case in which the rise in the platelet count was much delayed after splenectomy.

Sir THOMAS HOUSTON (Belfast), in concluding the discussion, said that what they all found so difficult in face of haemorrhage was to decide how long it would continue and with what result. One case would respond at once to treatment and another continue in grave danger in spite of it. He described an experiment which appeared to show that adding normal platelets to haemophilic blood would cause it to clot rapidly, and suggested that some qualitative change in the platelets might be concerned in the disease.

Professor WITTS, in reply, adhered to his opinion that eventual relapse was fairly frequent after splenectomy in thrombocytopenic purpura, and that further operation in search of spleniculi was not advisable. He reiterated his failure to confirm the efficacy of Dr. Timperley's extract, and pointed out that cures for haemophilia were liable to attain undesirable publicity. He himself had been reported, quite incorrectly, to be exploiting a treatment devised by Rasputin! It was exceedingly difficult to assess clinical results in this disease, and the satisfactory repetition of Dr. Timperley's work was also extremely difficult owing to the changes which were being made in the process of extraction and the alleged instability of the product.

SECTION OF SURGERY

Wednesday, July 21

Surgical Treatment of Peptic Ulcer

With Professor P. T. CRYMBLE, president of the Section, in the chair, a discussion on the surgical treatment of non-stenosing peptic ulcer was opened by Professor JOHN MORLEY (Manchester).

Professor Morley said that in non-stenosing ulcer the trend was towards conservatism because of improved medical technique. Diet had been found of more value than alkalis, and the fractional test meal had proved a better guide to treatment than diagnosis. But there were failures, and the indications for surgery needed crystallizing. With regard to duodenal ulcer he was against too early intervention in cases in which there was bleeding, although he believed in operating as soon as a severe haemorrhage had been recovered from. Simple gastrojejunostomy was ineffective in the treatment of a bleeding ulcer, and he thought it best to include the duodenum in some form of gastrectomy. In the case of non-bleeding duodenal ulcers which had failed to yield to medical treatment, some surgeons advocated gastrojejunostomy and others partial gastrectomy. Because of the grave risk of anastomotic ulcer after the former—he believed the incidence to be about 10 per cent.—he favoured partial gastrectomy when the acidity was high. In women, in whom the incidence of recurrent ulcer was less and the acidity lower, and in elderly patients, he favoured gastrojejunostomy. As to gastric ulcer, the fear of post-operative recurrence was very much less and the dread of supervening carcinoma much greater. The incidence of the latter had been much exaggerated; he believed it to be a rare event. The difficulty was more that of distinguishing between simple and malignant ulcer, especially since there was a not uncommon slowly growing carcinoma simulating ulcer symptomatically. Because medical treatment was so often followed by relapse, he thought surgical treatment offered more in the treatment of gastric than of duodenal ulcer. Partial gastrectomy he regarded as the operation of choice. Gastrojejunostomy and simple excision were unsatisfactory. He himself was in favour of the Schoemaker modification of the Billroth I operation. In gastrojejunal ulceration there was only one operation of merit—the undoing of the anastomosis and the performance of a high gastrectomy.

Mr. NORMAN C. LAKE thought that the differences of opinion between physicians and surgeons on this subject depended on their different interpretation of what constituted a cure. The surgeon hoped to achieve a per-

manent relief of symptoms and to make the patient a completely effective member of the community, whatever his occupation might be. The physician was frequently satisfied if the patient's symptoms could be kept under by permanent restrictions of one sort or another, with a level of general activity well below his normal. Although, when the aetiology of peptic ulcer was known, treatment would be exclusively medical or prophylactic, at the present time, he claimed, surgical treatment more closely approximated a real cure. In the argument as to the relative values of gastrojejunostomy and partial gastrectomy, he, Mr. Lake, agreed with Professor Morley. The neutralization of the stomach contents in gastrojejunostomy occurred only in the region of the stoma, as was proved by post-operative test meals, and the stoma was subject to ulceration. Partial gastrectomy was the operation of choice. He reviewed a series of 320 partial gastrectomies, 269 of which were performed for peptic ulceration. The number of unsatisfactory cases was approximately 4 per cent.; anastomotic ulceration occurred in under 2 per cent. A mild microcytic anaemia followed in a few cases; no case of pernicious anaemia had been noted. Mr. Lake thought the strongest argument against surgical treatment was the operative risk, which he considered higher than was generally represented. On this account he was not prepared to operate unless the patient had had a good trial of various medical treatments. In conclusion, he thought that any assessment of results in peptic ulcer must be made with a recognition of the vagaries in the natural history of the disease.

Dr. CARL SEMB (Oslo) reviewed the subject from a Scandinavian standpoint. There medical treatment, with six weeks' rest and suitable diet, yielded good results in approximately half the cases, depending mainly upon the length of history. Two or three courses of medical treatment were tried before surgery was invoked. In Germany gastrojejunostomy had been more or less abandoned; in America, on the other hand, it was the operation most employed. This discrepancy had been explained as due to the more severe gastritis in the German cases. The Norwegian cases seemed to resemble the American, and gastrojejunostomy, for ulcers mostly in the juxtapyloric area, showed 60 to 70 per cent. good results, 15 to 20 per cent. fairly good results, and 10 to 15 per cent. bad results. Anastomotic ulcer was rare in Norway. The unsatisfactory results were usually found in young patients. But partial gastrectomy was more often performed. It gave better results, with a mortality rate as low. In 250 Norwegian cases partial gastrectomy was followed by some degree of anaemia in 45 per cent. of cases. But in this connexion there was a great difference between the sexes. Whereas 25 per cent. of male patients had an anaemia, usually of slight degree, 70 per cent. of female patients presented anaemia, which in 35 per cent. of cases was severe. In some cases of small duodenal ulcers in young patients a pyloroplasty was performed. Dr. Semb finally described a modification of the Billroth I operation in which the anterior wall of the duodenum was split to overcome technical difficulties by making a larger opening.

Colonel A. B. MITCHELL (Belfast) said that, because of the excellent results of gastrojejunostomy in cases of stenosis he had always produced an artificial stenosis at the time of operation in duodenal cases. He agreed with Professor Morley in deprecating too early interference in bleeding ulcer.

The PRESIDENT showed a series of lantern slides illustrating the steps of partial gastrectomy, and pointed out a number of anatomical variations which might be encountered.

Mr. G. GORDON-TAYLOR said he was almost in complete agreement with Professor Morley except for the particular form of anastomosis advocated. He had been impressed by the small incidence of microcytic anaemia found by Professor Morley. He also had found, as Dr. Semb had stated, that post-operative anaemia occurred chiefly in women. On that account he was loath to do a partial gastrectomy in women. But he was still in favour of early intervention for bleeding ulcers because of the impairment of liver and renal functions which followed delay.

Professor MORLEY, replying, rather regretted there had been so little fundamental difference of opinion. It was only for gastric ulcers that he preferred the Schoemaker operation; he preferred the Polya method for duodenal and anastomotic ulcers because it was more destructive of gastric function. Again, he thought anaemia less prevalent after the Schoemaker than after the Polya operation.

Gastroscopy in Dyspepsia

Mr. H. W. RODGERS read a short paper on the use of the gastroscope in cases of dyspepsia with normal *x*-ray findings. He said that any investigation of a dyspeptic patient, where radiology had failed to reveal a lesion, was incomplete without gastroscopy, since a small ulcer, a severe gastritis, and rarely a carcinoma might be demonstrated. He showed coloured slides to illustrate both normal and pathological processes. Gastroscopy was of especial value where dyspepsia still continued after operation, although the stoma could only be fully viewed in 50 per cent. of cases.

Mr. HAROLD C. EDWARDS referred to the disinclination in this country to adopt gastroscopy as a routine. He regarded it as invaluable, preventing many unnecessary laparotomies. The PRESIDENT referred appreciatively to this new method of demonstrating the pathology of the "living" stomach. Mr. HAROLD DODD thought that, because of the failure of radiology to demonstrate anastomotic ulcers in his series, their incidence had probably been underestimated. He advocated routine gastroscopy in cases not doing well after gastro-jejunostomy. Mr. LAKE described a form of gastroscope he had employed some fifteen years ago. This he had introduced through the stomach wall after laparotomy, and from it he had learned a great deal of living pathology. Professor L. R. BRAITHWAITE (Leeds) wished to know if gastroscopy could throw any light on duodenal regurgitation, but Mr. RODGERS replying stated that the procedure was carried out under abnormal physiological conditions both of the stomach and of the patient, and that therefore little information was likely to be obtained.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Wednesday, July 21

Professor G. C. LOWRY, the president of the Section, was in the chair. Professor HERBERT THOMS of Yale University, whose paper appears in this week's issue of the *Journal* at page 210, was not able to be present.

Prontosil in Puerperal Infections

Mr. G. F. GIBBERD opened a discussion on prontosil and similar compounds in the treatment of puerperal infections due to the haemolytic streptococcus. His paper was based on 157 cases of puerperal infection treated at Queen Charlotte's Hospital between January, 1936, and March, 1937. After a preliminary reference to the various types of the drug and the dosage used, he compared this series of cases with a control series treated in the hospital for the two years before the introduction of the new drug. The cases were divided into groups according to the clinical invasion of the infection in the patients, and a comparison of the results in each case with the parallel set of cases in the control series was shown in a table. A second table showed the comparison between the present series and the control series in the duration of the illness (interval between confinement and discharge from hospital) in non-fatal cases in which an inflammatory mass was demonstrated beyond the limits of the birth canal. This table brought out the much shorter time spent in hospital

by patients who had been treated with prontosil. In conclusion, Mr. Gibberd pointed out that the mortality rate from haemolytic streptococcal infections had been much reduced by the new drug. It was necessary to consider whether the improvement since January, 1936, was due to the efficacy of the treatment or to a change in the virulence of the prevalent organism. Both factors might be concerned. In non-fatal cases in which tissues beyond the limits of the birth canal had been invaded there was some clinical evidence that the new drug did actually hasten the resolution of the inflammatory process. This seemed to show that the treatment rather than a change in the virulence of the organism was responsible for the improvement.

Dr. DORIS E. BROWN (Belfast) reported thirty cases of puerperal sepsis due to Group A haemolytic streptococcus that had been treated with prontosil in the Royal Maternity Hospital, Belfast, between May, 1936, and May, 1937. Of the thirty cases, twenty had a local infection of the uterus, seven were cases of septicaemia, and three had general peritonitis alone. Of the twenty cases of local infection, nineteen appeared to be benefited by prontosil, and there were no deaths in this group. For three years before the introduction of prontosil the death rate for cases of septicaemia was 87.5 per cent., and the mortality for all cases due to infection by the haemolytic streptococcus was 23.53 per cent. Since the use of the drug the mortality rate in cases of septicaemia was 28.57 per cent., and for all cases of puerperal infection 6.6 per cent. Prontosil had also been given to twenty-one patients with mastitis. In twenty resolution was complete, and the other patient was left with a small residual abscess which rapidly cleared up on incision. Of eighteen patients with mastitis —previous to the introduction of prontosil—nine developed breast abscesses, which were incised. Mr. L. CARNAC RIVETT emphasized certain points in the figures presented by Mr. Gibberd—for example, the sudden and dramatic drop in the cases of septicaemia from an average mortality of 71 per cent. to a mortality of 27.3 per cent. Professor H. J. DREW SMYTHE (Bristol) referred to a year's use of prontosil and its derivatives. The mortality rate was practically the same in the series treated with prontosil as in those not so treated, but the main point was the rapidity of cure in the treated cases. Dr. BETHEL SOLOMONS (Dublin) felt there was a grave danger in the drug giving a false sense of security. The general practitioner must be made to realize that he must not produce cases of failed forceps in the belief that prontosil would always act as a cure for the ensuing septicaemia. They had gone through the gamut of dettol cream, vaccines, and other possible cures for sepsis, but real cure still remained in prevention, which could only be accomplished by a knowledge of normal obstetrics as taught by skilled teachers. Professor J. CHASSAR MOIR (Oxford) said that a few clinical reports had appeared which suggested that in certain individuals protracted prontosil therapy might dangerously interfere with the blood-forming mechanism. This urgently called for investigation. It seemed unwise to give prontosil or its allies as a routine prophylactic measure. He also referred to the remarkable effect the drug had in combating *B. coli* infection of the urinary tract. In most cases the urine could be rendered sterile in about five days. This might account for the beneficial action of the drug in some cases of puerperal pyrexia due to a coincident urinary infection. Dr. J. ARTHUR H. SHERWIN (Melbourne, Australia) also joined in the discussion.

Habitual Abortion

Mr. PERCY MALPAS (Liverpool) in a paper on the problems of habitual abortion first presented a statistical review from which he concluded that perhaps eighteen out of every hundred pregnancies ended in abortion, seventeen due to casual random influences and only one to the presence of a recurrent factor. The presence of such a recurrent factor might be inferred with reasonable certainty after three successive abortions. He believed that recurrent stillbirths, recurrent abortions, and recurrent toxaemias and accidental haemorrhages were sometimes closely allied conditions. Possible aetiological factors which he discussed were twinning, foetal malformations, familial tendencies, chronic maternal diseases, syphilis, poor general health and nutrition, obstetric trauma, chronic nephritis, and recurrent toxaemias and accidental haemorrhages. One or more of these factors were found in sixty-five of the 115 cases he reviewed. In the remaining fifty no cause could be found; from a general consideration of these cases only two features emerged: a large number showed a marked tendency to obesity, and in those cases in which pregnancy was ultimately carried to term the children were under weight, indicating some metabolic failure.

Nine of his cases received wheat-germ-oil therapy, and of these two went to term. He thought that vitamin E deficiency was not a constant factor in recurrent abortion. Ascorbic acid might also play some part in controlling intra-uterine development. Four of his patients were treated with progestin, two successfully. Progestin therapy was probably the most effective known treatment for certain cases of habitual abortion. Thirty-three patients were treated by injections of organic arsenical compounds; in no less than thirteen of the twenty who gave birth to living children no cause had been detected for previous abortions, whereas among the failures only two cases belonged to this group. Mr. H. L. HARDY GREER (Belfast) opened the discussion. He regarded proluton as an endocrine preparation of some value.

Dr. O'DONEL BROWNE (Dublin) congratulated Mr. Malpas on his investigation, and stressed the fact that syphilis was only found in 5 per cent. of such cases, and in only approximately 50 per cent. of all cases of abortion could the actual cause be discovered. His own experience with proluton was most satisfactory; he was more reserved in his view on the use of wheat-germ-oil. Dame LOUISE MCILROY stressed the importance of food deficiency—especially in calcium—as a factor in recurrent abortions. Dr. J. J. HOLLAND (Perth, Western Australia) stated that sufficient thought was not given to the male partner, in whom the fault lay more often than was stated. It was useless to give all the methods of treating the female when she had no chance of carrying the pregnancy because of a fault in the male.

Hystero-salpingography

Mr. V. B. GREEN-ARMYTAGE (London) read a paper on hystero-salpingography, its obstetrical and gynaecological importance.

Mr. Green-Armytage remarked that the insufflation test for patency of the Fallopian tubes was open to criticism. In the first place a negative finding at a pressure of even 250 mm. Hg was often due to uterine spasm compressing the isthmial part of the tube, and not to any lack of patency. Secondly, insufflation gave no information as regarded both tubes. Thirdly, no evidence was obtained as to the site of occlusion or as to the existence of any developmental abnormality, as, for example, unicornuate uterus. Hystero-salpingography, on the other hand, he believed to be a precise and scientific method. It should be applied before and after all plastic operations upon the tubes; it was physically and psychologically of great prognostic value; and its therapeutic effect was double that of a simple insufflation. Discussing occlusion of tubes Mr. Green-Armytage further stated that in a consecutive series of 300 cases seeking relief for sterility the tubes were blocked in only 14 per cent., and in only 12 per cent. of these cases could the condition be attributed to gonorrhoea.

Dr. BETHEL SOLOMONS said the most important fact elicited from this paper was that the "doubting Thomases" who would not even try plastic operations on the tubes must have been silenced. This series of films showed what

he had endeavoured to prove for many years—that operations on the tubes produced a small but important percentage of success in many hopeless cases. He had started the first *x*-ray department in connexion with a maternity hospital in 1926 at the Rotunda, and he had done many salpinograms since. Ethidol, he believed, gave the best results, and he took a second film ten minutes after the first to eliminate spasm of the uterus. He had observed that very severe puerperal sepsis was seldom followed by sterility, but a mild degree of sepsis with parametritis had often been followed by closure of the tubes. Salpingograms should be taken as a routine after plastic operations on the Fallopian tubes. Professor CHASSAR MOIR and Professor LOWRY congratulated Mr. Green-Armytage on his excellent results, and urged the continued use of this method of dealing with the investigation of tubal disease.

SECTION OF PHARMACOLOGY AND THERAPEUTICS INCLUDING ANAESTHETICS

Wednesday, July 21

Variation in Response to Drugs

With the President of the Section, Professor E. B. C. MAYRS (Dunmurry) in the chair, Professor A. J. CLARK (Edinburgh) opened a discussion on individual variation in response to drugs.

Professor Clark said that the method of determining the minimum lethal dose of a drug by giving varying doses to a small number of animals was inaccurate because no account was taken of individual variation, a factor which depended both upon the population and upon the drug. The extent of this variation could be reduced by making the population as uniform as possible, but, even so, animals still showed wide variation in their response to drugs. If the shape of the characteristic curve from 10 per cent. to 90 per cent. mortality was established the laws of probability could be applied, and it was possible to calculate the chance of a mortality of 1 in 1,000. Characteristic curves could also be obtained by plotting the dosage on the logarithmic scale. So far as human variations to drugs were concerned, it had been shown that 16 per cent. of a series of patients were narcotized by 75 per cent. of the median narcotic dose of sodium amytal, a variation comparable with that found for the lethal action of this drug in animals. Likewise, 50 per cent. of the population were narcotized by 80 per cent. of the dose of avertin needed to narcotize 84 per cent. This was also comparable with animal experiment. Professor Clark stated that individual variation was an unattractive subject because its existence constituted a limitation to therapeutic measures of an annoying character. It seemed probable that the extent of individual variation was consistently underestimated, because if an individual representing an extreme of variation happened to be encountered in a small group, the result was apt to be discounted as an accident. The evidence available, however, suggested that whenever it was possible to measure quantitatively the effects produced by a drug in a large population an orderly distribution of variation in response was revealed.

Professor J. H. GADDUM said that, although it was possible to make some allowance for such factors as age, sex, weight, and the general condition of patients, he considered that a large part of the individual variation to drugs was unpredictable. A chance must always be taken when prescribing, but he liked to know as far as possible the odds for and against. He foresaw the time when it would be possible to predict the percentage of cures to be expected from any given dose and to estimate exactly the danger involved in increasing the dose to any given extent. At present there was a lack of data of a quantitative nature in connexion with human response to drugs, and there were two ways in which this information could be obtained. In some cases it was possible to measure the sensitivity of the individual—as, for example, when digitalis was administered and bradycardia observed. The amount consumed measured the sensibility of the patient, and if a large number of such figures were available it would be possible to calculate the variability and also, possibly, the effect of age, sex, and weight. The second method was to give the same two doses each to a series of cases. From the percentage of reactions it was possible to calculate the variability. For example, if the percentage of toxic effects due to two different doses of an organic arsenical drug were known, it was possible to calculate the probable percentages corresponding to other doses and thus to know what dose would be quite safe.

Dr. GEORGE GRAHAM drew attention to the local reaction which might follow the administration of insulin. He was able to distinguish four groups. In the first complaint was made of a stinging sensation as soon as the insulin was injected. This seemed to depend upon the fact that the insulin employed was not isotonic to sodium chloride. In the second group complaint was made of red, irritating reactions, resembling those sometimes occurring after the injection of a vaccine. If this phenomenon was observed a trial should be made of all the different brands of insulin, and usually one would be found which would cause little or no pain. It was possible, however, to desensitize a patient suffering from this type of reaction. The third group of patients comprised those in whom a hypertrophy of the subcutaneous tissues resulted in a fatty tumour; and in the fourth group a local fat atrophy caused a depression in the skin. If these conditions were noticed the patient should be persuaded to vary the site of injection as much as possible and another brand of insulin should be tried.

Dr. P. MACCARVILL (Dublin) said that from the dermatological point of view individual variation in response to drugs was without limit. Whether or not a person became sensitive to a substance depended upon three factors: his personal idiosyncrasy; the dose of the antigen; and, if the dose of the antigen was sufficiently large, no personal idiosyncrasy was required. It was fortunate that the skin as an organ was exceptional in the intensity of its variations and sensitivity, for, if other organs were equally sensitive, still greater difficulty would be experienced in determining both therapeutic and lethal doses. The promiscuous use of iodine, picric acid, and similar antiseptics caused frequent trouble, especially when continued after the manifestation of obvious reaction in the skin. Repeated parenteral administration of arsenic and gold after advance warnings in the form of reddened forearms or moist flexures was asking for trouble; yet very few cases of exfoliative dermatitis occurred without these previous warnings.

The PRESIDENT was impressed by the fact that pharmacologists evidently were interested in quantitative variations and clinicians in qualitative variations. If a simple method could be found of estimating quantitative variations in clinical practice it would be of considerable value.

Dr. P. C. P. INGRAM (Newport, Mon.) referred to the frequency with which powerful arsenicals were administered without previous clinical examination and without untoward effect. The nervous tension experienced by the syphilitic patient undergoing treatment might be a factor in the production of undesirable reactions. Dr. J. F. BROCK (Cambridge) asked if it was believed that idiosyncrasies were inherited or acquired, and if they were met with in children. Professor H. S. RAPER (Manchester) cited experiments performed many years ago in which mustard gas diluted with benzine was applied to the forearm of many subjects. There was considerable variation in the reactions produced by a substance with which the subjects could not previously have come into contact. Professor DAVID CAMPBELL (Aberdeen) considered that if there was a variation of 1 to 4 in the fatal dose of a substance the use of intravenous anaesthetics constituted a very real danger. Likewise, accuracy could not be

expected from the administration of digitalis when the dosage was based solely on the weight of the patient. He believed that drugs should be given singly and not in mixtures, and that the dose should be increased until the desired effect was produced.

Iron Therapy in Hypochromic Anaemia

Dr. J. F. BROCK (Cambridge), in a paper on this subject, said that nowadays perhaps the action of iron in this condition was less perfectly understood than it was five years ago. This was because the result of balance experiments revealed a number of cases of hypochromic anaemia in which iron deficiency was not the sole mechanism at fault. This type of anaemia was often associated with an inadequate diet or with chronic loss of blood; but achlorhydria was sometimes a factor. Balance experiments demonstrated that when patients suffering with this condition were given enough iron by the mouth 11 per cent. to 32 per cent. of the amount ingested was retained in the body, although a consideration of the increase in the haemoglobin percentage suggested that the amount retained in the blood was very much less. Many patients with a mild degree of hypochromic anaemia improved when given relatively small amounts of iron, but he thought that in general the daily amount of iron administered should not be less than 300 milligrammes. This could be prescribed in the form of pil. ferri, 45–90 grains, or of iron and ammonium citrate, 60–90 grains, a day. The intramuscular injection of iron preparations was useless; if sufficient iron to cure the anaemia were injected toxic symptoms might occur. All forms of organic and colloidal iron were relatively ineffective, and the concurrent administration of other drugs, such as copper, manganese, and cobalt was not indicated. It was possible that in a small group of these patients iron had an additional effect upon the intestinal tract, but it was impossible to distinguish this group clinically. Sufficient iron should be given to enable the patient to respond, and an adequate diet was also desirable.

Dr. J. H. THOMPSON (Croydon) inquired if there was any advantage in administering glycerin with iron and ammonium citrate. Professor CLARK said that, as the importance of the duodenum as an absorbing centre was being increasingly recognized, he wondered if the administration of massive doses of iron altered the reaction of the contents of this organ. It was further possible that ferrous salts had a buffering effect. Professor CAMPBELL pointed out that Dr. Brock had already cited a case with achlorhydria in which the absorption of iron was greater than in cases with normal acidity. Professor GADDUM considered that the concurrent administration of vitamin C promoted the absorption of ferrous salts.

In reply Dr. BROCK stated that little was known regarding the absorption of iron from the intestine, but he felt that physico-chemical reactions played an important part in this process.

SECTION OF ANATOMY, PHYSIOLOGY, AND BIOCHEMISTRY

Wednesday, July 21

Anatomy and Physiology of the Sex Glands

The President of the Section, Professor E. C. DODDS, opened a discussion on the anatomy, physiology, and biochemistry of the sex glands. Professor Dodds's paper was published in last week's *Journal* at page 163.

Dr. A. S. PARKES referred to the part played by the sex hormones in the development and treatment of prostatic enlargement. He reviewed the evidence which led to the suggestion that prostatic enlargement was due to excessive oestrogenic activity of the testis, and showed that both progesterone and testosterone could inhibit the oestrous changes.

Dr. P. M. F. BISHOP stated emphatically that anterior pituitary preparations were ineffective when administered by mouth. He mentioned that examinations of vaginal smears and the production of "threshold" uterine bleeding were useful indications of the physiological dosage of oestrin in women.

Dr. J. M. ROBSON (Edinburgh) showed that luteal function could be maintained in hypophysectomized rabbits by means of oestrin. In twenty-one out of twenty-two cases of pre-eclamptic toxaemia the administration of progesterone had prevented the onset of fits. None of these twenty-two patients had died, as compared with a mortality of 10 per cent. in thirty-one control cases. Finally he referred to the prolonged and potent oestrogenic activity of triphenyl ethylene when administered by mouth.

Mr. R. K. BOWES described a method of obtaining endometrial strips by using a modified Randall's curette. Direct assessment could thus be made of the progress of endocrine therapy in menstrual disturbances. He had obtained satisfactory results by treating with oestrin cases of kraurosis, senile vaginitis, and dyspareunia occurring at the menopause. Gonadotropic extracts, he thought, must be given to supplement oestrin to obtain repetition of the menstrual cycle in cases of amenorrhoea, and he had been favourably impressed by "antex" used in a small series of cases of amenorrhoea, oligomenorrhoea, and gross irregularity of menstruation.

In the absence of Mr. W. R. WINTERTON the president showed some slides indicating the appearance of the human vaginal smear at the time of the menopause and during the phase of full oestrous activity. Dr. PARKES suggested that the changes in the vaginal smear might be due solely to the psychological effects of treatment. Dr. Bishop had, however, obtained no such changes while administering an inert material for a preliminary control period. Dr. R. D. LAWRENCE asked whether there was danger of inducing carcinomatous changes by the administration of oestrin. Professor DODDS believed that no such danger existed if oestrin were employed solely for the purpose of reproducing physiological phenomena. He felt, however, that triphenyl ethylene, the synthetic oestrogenic compound referred to by Dr. Robson, should be employed clinically only with considerable caution.

The Parathyroid Glands

Professor W. J. E. JESSOP (Dublin) read a paper on the clinical bearings of the parathyroid. These glands secreted a hormone the primary object of which was the maintenance of the blood calcium at an optimum level for the control of the neuro-muscular system, and this was attained by controlling the balance between deposition and absorption of calcium salts in the bony reservoirs. He reviewed the clinical manifestations of hypoparathyroidism, of which tetany was the chief. Tetany might also be caused by rickets and alkalosis. It had been recently suggested that otosclerosis was a manifestation of hypoparathyroidism. Hyperparathyroidism occurred in the presence of a parathyroid tumour, a case of which he gave a full account. Dr. PARKES inquired whether there was any evidence of excessive function of the parathyrotropic hormone of the pituitary in cases of parathyroid tumour, and whether this hormone had been employed in hypoparathyroidism. Professor JESSOP answered both questions in the negative. Professor DODDS had seen cases in which tetany had persisted for some time following an operation for Graves's disease but had eventually cleared up. Professor JESSOP suggested this might be due to gradual hyperplasia of the remaining parathyroid tissue.

Recent Work on Insulin

Professor A. WORMALL, in a paper on recent work on the chemistry of insulin, referred to the various methods of studying the constitution and structure of insulin, and he outlined the present position with regard to the chemical properties of this hormone. The crystallization of insulin

by Abel, and more recently as a zinc salt by Scott, was mentioned; insulin was a protein which contained fewer different amino acids than most proteins. There was evidence, from the work of various authors, that the cystine, glutamine or glutamic acid, tyrosine, and the free amino groups were essential for the characteristic hypoglycaemic action of insulin. The speaker described experiments, carried out by his colleagues and himself, which showed that blocking of the free amino groups by the action of phenyl *iso*cyanate or of benzyl carbonyl chloride caused complete inactivation of insulin. He also referred to investigations which had failed to demonstrate any antigenic activity of insulin.

Dr. R. D. LAWRENCE, in a paper on the use of protamine insulin and similar preparations, said that he had been unable to confirm the successful results claimed by Szent-Györgyi for the treatment of diabetic ketosis with succinic acid by mouth. With regard to insulin it seemed unlikely that it would ever be available for oral administration. Protamine insulin ("retard" insulin), however, was more lasting in its effect than soluble insulin, because it was injected as a precipitate which was only slowly dissolved and utilized at the normal reaction of the tissues. Its effect lasted for twelve to sixteen hours. Zinc protamine insulin was even more stable, and its effect lasted for twenty-four to thirty-six hours. Owing to the slow absorption of these compounds the amount of insulin circulating at any one moment was less than immediately after an injection of soluble insulin. The blood sugar rose higher, therefore, after a carbohydrate meal. Such hyperglycaemia, however, was not attended by ketosis. Owing to the prolonged effect of the new compounds there was a danger of hypoglycaemia occurring during the night, and it was wise to prescribe a buffer meal of carbohydrates before going to bed.

Dr. GEORGE GRAHAM agreed with Dr. Lawrence in regarding the new insulin compounds as being valuable additions to the list of diabetic remedies. They should, however, be used with caution, for the symptoms of overdosage were less apparent than in the case of soluble insulin, and the patient was liable to pass without warning into hypoglycaemic coma. Dr. PARKES mentioned the possibility of the development of anaphylactic phenomena after the administration of insulin obtained from different sources. Professor WORMALL thought that changing the brand of insulin was unlikely to arrest the anaphylactic phenomena. Professor DODDS had found that combination with zinc had prolonged the activity of both vasopressin and histamine, and asked whether this was due to a direct action on the tissues at the site of injection. Both Professor WORMALL and Dr. PARKES believed this to be the case.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE

Wednesday, July 21

Early Diagnosis of Intracranial Tumours

With Dr. GEORGE RIDDOCH, President of the Section, in the chair a discussion took place on the early diagnosis of intracranial tumours.

Dr. F. M. R. WALSHE said that nowadays there was a danger of technique triumphing over reason in this sphere of medicine. Taking the clinical history in cases of intracranial tumour was an art which had to be learned; for instance, patients should not be questioned in such a way as to suggest the answers the questioner had in mind. The discovery of clinical signs should always be followed by a careful assessment of the relative symptoms. In his opinion many of the modern expensive technical investigations were unnecessary; too much reliance was placed on them and too little importance was attached to the due appreciation of the clinical evidence. Dr. Walshe, discussing briefly Cushing's report on 2,000 cases of intracranial tumour, mentioned that several cases had been wrongly sent for cranial operations, and in many others radiography could not have afforded an early diagnosis. Dr. Walshe referred to four features in the onset. (1) There was first the occurrence in a middle-aged patient, who had never been so afflicted before, of a series of recurrent epileptiform fits which were separated by intervals free from all subjective or objective symptoms. These generalized fits were more common than the localized ones. (2) Signs of raised intracranial pressure were not in some cases associated with vomiting, and the latter was not always projectile in nature. Slowing of pulse was uncommon except in rapidly growing tumours; it was more common in subdural haematoma than in intracranial tumour. (3) In other cases there were signs of a slowly progressive local lesion of the brain. He pointed out that slowly developing weakness of one side of the body in the middle-aged might be due to paralysis agitans. (4) When the onset suggested a malignant process it should be remembered that carcinoma of the brain was frequently secondary to a primary carcinoma of the lung. Such secondary growths were usually multiple. It was difficult to make a localizing diagnosis. Signs of meningitis might be present, and should be correctly assessed. There was usually a confused clinical picture in these cases, but progressive loss of weight with cachexia was often a significant feature. In any event the early diagnosis of an intracranial tumour was difficult, and might at times be impossible. Tumours might even develop without any clinical manifestations, and in few cases was diagnostic certainty permissible.

Mr. N. M. DOTT (Edinburgh) stated that three questions had to be answered. (1) Was a tumour present? (2) If so, where was it located? (3) What was its nature? Clinical neurology was the principal factor in diagnosis. Mr. Dott devoted his speech mainly to indicating the value in diagnosis of various special accessory methods of technical investigation, and showed illustrative lantern slides. Cerebral radiography revealed local signs of calcification or osteoporosis in tumours, and there might be evidence of skull erosion. Sometimes these signs were forthcoming before the onset of clinical symptoms. Examination of the cerebro-spinal fluid should be a routine procedure, but in cases of increased pressure a lumbar puncture should only be performed in a hospital where it was possible to operate immediately afterwards. A suggestive finding was a pressure of over 250 mm. of water; another one was an increase of protein in the fluid without a corresponding rise in the cell count. Ventriculography might be dangerous in low-pressure cases owing to the risk of compression of the brain stem, or risk to life might be incurred owing to the cerebellum being pressed upwards. Ventriculography should be the last diagnostic step to be undertaken, and be performed only when the conditions were suitable for an immediate operation. By these procedures an accurate differential diagnosis might be obtained. Cerebrovascular radiography gave a more intimate knowledge of the tumour itself rather than of its anatomical position in the skull; the state of the arterial and venous vascularization of the tumour could be precisely determined. The anatomical relation of the tumour must be carefully defined. The objective of the diagnosis was the cure of the patient, and therefore treatment was an essential factor in the diagnostic investigation. The investigator must consequently be fully familiar with the possible lines of treatment. A diagnostic physician might be seriously handicapped if he was ignorant of the surgical possibilities in any case, and hence both surgical and medical specialists must be consulted.

Dr. H. L. PARKER (Dublin) said that the first line of attack lay with the general practitioner, who could detect cases before, for example, irrecoverable blindness developed. Memory might be clouded even at the beginning, and symptoms of importance be thus not reported. Smell and taste might be affected early, and vision only later. Cases

were cited to illustrate these points, and it was emphasized that loss of memory might be an important early symptom, especially when associated with a habitual tendency to repeat statements. Hemianopsia was often an early symptom, as was also loss of hearing in one ear. These first symptoms were of great diagnostic significance, since later ones might be confusing. Dr. Parker strongly favoured team work in investigation by one or two surgeons and physicians who had been previously acustomed to work together. The neurologist was essentially a man of thought, predisposed to waiting for elucidatory evidence; the surgeon was a man of action, and might be dangerously precipitate. These lines of approach should converge in the successful treatment of the patient. Spinal puncture might be risky in these cases, especially when the tumour was situated above the tentorium. In a technical investigation the order of precedence should be the general practitioner, the neurologist, and the surgeon in conjunction with the neurologist. Early diagnosis and correct localization were the primary objectives.

Mr. A. A. MCCONNELL (Dublin) agreed that the early diagnosis of intracranial tumour was essentially a matter for the general practitioner. When there was evidence of something encroaching upon the cranial cavity the diagnosis of a cerebral tumour was not infrequently correct, since these lesions were not uncommonly found, for instance, in post-mortem examinations. Only in young patients was headache an early significant finding. Vomiting, with or without headache, was significant when there were intervals in which the appetite was good and the working capacity normal. Surgeons should use all the clinical methods employed by physicians, for operative judgement depended on clinical knowledge more than on the knowledge derived from technical investigations, though the latter were essentially parts of the subsequent operative treatment, guiding, as they did, its various lines in different cases. They were supplementary, and did not replace clinical methods.

Dr. T. TENNENT said that psychological symptoms often appeared early in cases of intracranial tumour. Mental symptoms were more frequent in left-sided lesions and supratentorial growths. They included difficulty in concentration, loss of memory, irritability, confusion, stupor, worry about personal health, and suicidal tendencies. Erroneous diagnoses might, therefore, be easily made by the general practitioner. Functional mental disturbances in cases of tumour might simulate those in psychotic states, and were often chronic and resistant to treatment. There might be an exaggeration of pre-existing personality traits, such as homosexuality. Excitement symptoms might be insidious as regards their evolution, and they were often associated with lesions of the frontal lobes, but differentiation in this regard was of uncertain value. When the organic symptoms were predominant their duration was short and the deterioration of the patient rapid. No mental symptoms could be associated with any one special lesion of the brain.

Mr. W. GREY WALTER, speaking as a physiologist who had applied the measurement of varying electrical potentials to the brain tissues (electro-encephalography), described the uses and limitations of this technique, and reported a series of cases dealt with at the Maida Vale Hospital. He remarked that this method involved no danger or discomfort to the patient, and the time of examination was only one-quarter to half an hour. The appearance of rather slow pulsations of the potentials were amplified and recorded; their origination could be localized by technical means. The term given to them provisionally was "delta waves," in comparison with the "alpha waves" of Buerger, which constituted the normal rhythm. These delta waves were caused by the cortex in the neighbourhood of the tumour, and not by the growth itself. They were due to induced disturbance of the cerebro-spinal fluid or of the circulation. If the tumour was small or superficial, or did not involve the cortex very much, the waves might be absent in some cases. In other diseases they might also be absent, and the results could not then be trusted. This method of investigation was useful only when the short delta waves were present and the cortex was affecetd by the tumour. Cerebral tumours might be confused with idiopathic epilepsies, but the foci of these abnormalities were fortunately only placed in one or two definite parts of the brain, and the waves presented slight differentiating abnormalities. While this method was only available for the diagnosis of intracranial tumours, it might nevertheless be of very considerable value in them, indicating the way in which the cortex was functioning. The technique had not yet been made suitable for use by general practitioners, but in special cases of difficulty it might be employed by specialists with advantage.

Dr. A. GURNEY YATES (Sheffield) stressed the danger inherent in lumbar punctures. There might be no time for an operation to relieve dangerous symptoms, and careful precautions must therefore be taken. The fluid should be drawn off slowly and in small amount. An equal quantity of saline solution should be immediately injected; this might possibly relieve dangerous symptoms. Team work was always preferable in cases of intracranial tumour; an ophthalmologist and a deep-ray therapist might be helpful. Dr. J. PURDON MARTIN said that it was necessary to have more information from those who practised the newer methods of investigation as to their dangers and also of the proportion of cases in which reliable positive evidence was obtained when medical and neurological investigations had failed. In practice the problem was whether, when a cerebral tumour was suspected, one was justified in submitting the patient to ventriculography. Dr. H. G. GARLAND (Leeds) added that the most important way in which a cerebral tumour could be detected with certainty at an early stage was to educate the general practitioner to recognize the common first manifestations. He thought that the cases of visual failure, epilepsy developing in adult life, focal neurological syndromes, and mental changes were usually sent for specialist advice at an early stage, so that the recognition of the headache due to intracranial pressure was one of the most fundamental points in early diagnosis. The practitioner should be trained to analyse the characters of headache, for in many cases careful analysis would lead to an early diagnosis of intracranial tumour. Dr. W. RITCHIE RUSSELL (Edinburgh) stressed the importance of mental changes. It was very regrettable that cases of tumour should so often be sent to mental hospitals. Over the age of 45 to 50 the classical signs of brain tumour were often absent, and only insidious changes in the patient were noticeable at first. Professor E. MAPOTHER cited illustrative cases of moral degeneration as an early symptom of a cerebral tumour. There was not always an accentuation of the pre-existing mental disposition. Sometimes exastly opposite temperamental changes appeared—for instance, intemperance and dishonesty in previously strictly upright characters. This point was not yet adequately realized.

Replying to the discussion, Dr. WALSHE insisted on the need for neurological education. He thought that the electro-encephalograph was not yet scientifically safe. Mr. DOTT, agreeing that the discussion had been most instructive, stated that some cases were quite unsuitable for lumbar puncture. In focal epilepsy arterioradiography could be very helpful. The value of this and other methods could be best assessed by those who used them repeatedly. Thorotrast, though a carcinogenic substance, had done no permanent harm in his experience to patients in middle age, but he was doubtful whether it should be used for young patients. Dr. PARKER upheld the diagnostic value of encephalography. It was still in its first year of development in this respect, but some failures had been set off by many successes. The PRESIDENT, summing up, said that as yet there was no short cut to diagnosis. Clinical examination still remained paramount. The psychiatric aspects of intracranial tumours needed more investigation by psychologists and neurologists.

SECTION OF ORTHOPAEDICS

Wednesday, July 21

Fracture of the Neck of the Femur

After the chair had been taken by Mr. S. T. IRWIN, president of the Section, a discussion on operative treatment and results in fracture of the neck of the femur was opened by Professor E. W. HEY GROVES (Bristol).

Professor Hey Groves pointed out that Smith-Petersen's successful use of a steel nail in the treatment of this fracture was a triumph of practice over theory, for it had long been agreed that the use of metal for the internal fixation of fractures was to be avoided whenever possible. For sound physiological reasons the trend of almost all recent work had been away from the use of metal. There was now a danger that Smith-Petersen's method might suffer from the excessive popularity that had been the downfall of Lane's and Lambotte's methods, and the speaker hoped that readers of subsequent papers would dwell on the limitations and possible dangers of pin fixation as well as on its undeniable merits.

Professor SVEN JOHANNSON (Gothenburg) gave a detailed account of the blind method for insertion of the Smith-Petersen nail that he had used during the last six years. The results were striking. In all, 179 cases had been operated on with a mortality (from all causes—early and late) of 10 per cent. Of the patients who lived 95 per cent. had good bony union and function. In twenty-six cases the nail had been removed because it had worked out laterally and was causing pain; at the time of removal bony union was already well advanced.

Dr. ELLIS JONES (Los Angeles) thought that the acceptance of Smith-Petersen's method was perhaps a little too enthusiastic, and that surgeons must not (to quote the words of Sir Robert Jones) forget that "the problem before each of us is how to improve our skill and technique in both the operative and manipulative treatment, and how to determine what method we must adopt in each individual case to give our patients the surest, safest, and most complete restoration of function." The following methods required consideration: (1) the manipulative method of Whitman, which necessitated fixation of the limb in plaster; (2) internal fixation with metal, which rendered plaster unnecessary (a useful alternative to Smith-Petersen's method was that described by Austin Moore, who used three separate small stainless steel nails inserted through the trochanter and neck into the head of the femur); (3) internal fixation with an autogenous bone graft, where again a period of fixation in plaster was necessary.

Dr. Jones described his own operation as an alternative to the tibial bone graft favoured by Albee. Only one incision was required, seeing that the graft was obtained from the great trochanter and the upper end of the shaft of the femur. The removal of this graft enabled the surgeon to inspect the fracture site and confirm the accuracy of the manipulative reduction. A hole was now drilled through the trochanter and neck into the femoral head, and the graft was inserted. Being a square peg in a round hole it fitted snugly, and as it was cancellous bone of the same type as that found in its new bed vascularization was rapid. Further fixation was obtained by the insertion of two Moore's pins. Although the results of this comparatively new procedure were most encouraging, it must not be said that this or any other method was the method of choice. In the hands of Leadbetter, Whitman's method was now giving bony union in 71 per cent. of cases ranging in age from 40 to 90 years, and it was probable that manipulative reduction and plaster fixation was still the method of choice in young patients in whom the disadvantages of plaster fixation were negligible. In older patients bone grafting or pin fixation were preferable, with a slight bias in favour of pin fixation in the aged.

Dr. ERIC I. LLOYD was disappointed at the absence of specific reference to late results in Professor Johannson's series of cases. It was by no means certain that an early success was permanent. In two of his own cases he had removed pins sixteen months and twelve months after operation (by which time they had ceased to have any useful function) and slipping at the site of fracture had promptly followed. The radiographs had suggested that bony union was sound, but this was evidently not the case; he felt that surgeons would soon have unpleasant surprises in certain cases they now regarded as successes. A few fractures of the neck of the femur were impacted abduction fractures, the normal angle between the head and the neck being diminished. Such cases recovered completely with nothing more than rest in bed, and provided that there was undoubted evidence of impaction operative fixation was not required. Of fifty fractures of the usual type seventeen had been operated on two or more years ago with bony union in 60 per cent., and seventeen operated on between one and two years ago showed bony union in more than 80 per cent. This improvement was probably due to improvement in technique, though it was possible that several cases now counted as successes might go wrong later.

Mr. R. WATSON JONES (Liverpool) had formerly been a strong advocate of open-pin fixation, but during the last two years had abandoned it in favour of the blind operation—not so much on the grounds of simplification of technique as on the conviction that the less the fracture site was disturbed by the surgeon the better. The greatest bogy in the treatment of this fracture was necrosis of the femoral head and the arthritic changes that inevitably followed even if union occurred. Necrosis was due to cutting off of the already precarious blood supply to the head, and this could be prevented only by the avoidance of further trauma during the manipulative reduction, by early fixation so that repair could begin as soon as possible, and by keeping clear of the fracture site when the pin was actually inserted. He agreed with Mr. Lloyd's conservative attitude toward impacted abduction fractures.

Mr. H. A. BRITTAIN (Norwich) confessed that his enthusiasm for the Smith-Petersen operation might be an expression of youthful ardour, but what method, he asked, could give comparable results in the hands of surgeons whose experience was limited to not more than fifty cases? His own method (previously described in the *Journal*) had the merit of simplicity, and had given bony union in 82.6 per cent. of his series of forty-six cases.

Mr. K. H. PRIDIE (Bristol) favoured the Hey Groves method. The correct line for insertion of the pin was determined by a guide with two spikes, which perforated the skin over the neck and head of the femur and were pushed in until they made contact with the bone. It had been said that the medial spike might injure the femoral artery, but this fear had been dispelled by a series of post-mortem investigations. He found (by injection of the femoral artery and antero-posterior radiography of the pelvis) that the vessel always lay conveniently medial to the central point of the femoral head. A pneumatic hammer was used to push in the pin, which effectively prevented separation of the neck and head when the pin was passing from the one to the other.

Mr. W. C. GISSANE believed that the operation began with the radiography of the hip. It was most important that comparable views should be obtained from start to finish, and only the surgeon could determine the correct positions for the *x*-ray tube and the cassette. He, too, favoured the closed method, and employed local anaesthesia, except when the pin was actually being inserted. He did not approve of interference with the compact bone at the point of entry of the pin: a stout rim of bone around the pin enabled him to bury the head under the rim and so prevent extrusion of the pin.

Mr. H. O. CLARKE (Manchester), another advocate of the closed Smith-Petersen operation, gave a detailed report

on a series of twenty cases. Two patients died within twenty-four hours of admission to hospital, the remainder being treated by operation. One died two days after operation, and post-mortem examination revealed advanced myocardial disease; the other died from uraemia three weeks after operation. There was bony union in fifteen cases and non-union in one. In conclusion, he made an eloquent plea for the early transfer of all such cases to a recognized fracture centre. Under modern conditions there was no excuse for attempting to deal with them in imperfect surroundings.

Dr. CARL SEMB (Oslo) also reported a series of 101 cases treated by Sven Johannson's method. He advocated skeletal traction to obtain correct apposition of the fragments, followed by operation at the bedside so that disturbance of the patient, and of the fracture, was reduced to a minimum.

In the afternoon cinema films illustrating some of the techniques employed were shown by Professor SVEN JOHANNSON, Mr. ERIC LLOYD Mr. PRIDIE, and Mr. BRITTAIN.

SECTION OF OTO-RHINO-LARYNGOLOGY

Wednesday, July 21

Complications of Otitis Media

With the President of the Section, Dr. HENRY HANNA (Belfast), in the chair, a paper was read by Mr. A. A. MCCONNELL (Dublin) on the non-suppurative intracranial complications of otitis media.

Mr. McConnell divided the intracranial complications into suppurative and non-suppurative. The pathology of the former was well understood as each stage in the process had been observed post mortem, but in non-suppurative complications operative findings were often inconclusive and necropsies were rare. He divided the non-suppurative complication into encaphalitic lesions and derangement of the amount, or of the circulation, of the cerebrospinal fluid. The latter led to a rise in the general intracranial pressure. Borries and Symonds had discussed the encephalitic lesion under the terms "otogenous encephalitis" and "non-purulent encephalitis" respectively. It might be the prelude to an abscess of the brain, or at least give rise to the "symptoms of an abscess without abscess." So far as treatment was concerned the case must be treated as one of abscess until negative exploration or subsequent history proved that it was not so. Derangements of the amount of, or of the circulation of, the cerebrospinal fluid were next discussed. The first was described by Symonds as otitic hydrocephalus, using the term to mean an excess of fluid. Outstanding symptoms were intermittent headache and papilloedema. The patient might look extremely well and there were no localizing signs such as were usual in encephalitis. Of great importance was the normal fluid with no excess of protein or of cells. As there was no obstruction to circulation the excess of fluid might be removed at any point in the pathway of the cerebrospinal fluid. The second type of derangement gave rise to collections of fluid localized in the ventricles or in the cisterns of the posterior fossa. They demanded direct removal. Mr. McConnell therefore advocated, in the first type, lumbar puncture as being safe and curative. In the second type it might not be safe and was not curative. As the clinical differentiation of the two types was difficult he suggested ventricular puncture as being a safer and generally applicable procedure.

Otitis Externa

Mr. L. GRAHAM BROWN, in a paper on otitis externa, included all infections of the skin of the meatus or of the skin of the surrounding parts with which it was contiguous. He divided the varieties of lesion into otitis externa circumscripta or furuncle, otitis externa diffusa, otitis externa mycotica or otomycosis, eczematous otitis externa, and otitis externa haemorrhagica. In treatment three main principles were to be observed: (1) thorough cleansing; (2) the application of a non-irritant germicide; and (3) protection from further irritation and infection. He advocated syringing as the safest form of cleansing. The parts could be dehydrated subsequently with alcohol; afterwards he preferred ointments containing zinc. Sulphur and mercury ointments appeared to be too irritating. It was sometimes necessary to give an anaesthetic to exclude other trouble—for example, otitis media deep to the external lesion. Local treatment must not omit the surrounding parts, especially an infected scalp. General treatment included vaccine and serum therapy; manganese and stannoxyl; diet, especially in eczematous patients; light therapy and *x* rays.

Mr. J. W. KILLEN (Londonderry) advocated syringing with a weak solution of lysol. In some eczematous cases he had had much success with resinol ointment, and the general effect of a vitamin A preparation was of value. Mr. T. B. JOBSON (Guildford) agreed about cell sensitivity and advocated the use of calcium in this respect. He wished to say a word about surgical treatment. He had been brought up, as had probably others present, on the crucial incision and curetting of the furuncle. This was now considered dangerous and might spread the infection to surrounding tissues. If any incision were made it should be small and only just sufficient to allow exit of retained pus. Mr. DONALD WATSON (Bradford) divided cases into acute and chronic. He "packed" his cases of boils with aluminium acetate. Like Mr. Killen, he found the cresols useful. Ointments should have a vaseline base, the most effective being salicylic acid and sulphur. He divided chronic cases into those with middle-ear discharge and those without it. The former might need a mastoid operation. Mr. C. DE W. GIBB (Gloucester) found casts in many cases he saw, especially children. Entry of water must be prevented, although patients might think it "dirty" not to wash out the ear with soap and water. He cleaned the ears with olive oil. Re-infection probably often took place by unconscious scratching at night. Mr. DONALD WHEELER said it was most important to see the patient frequently in the early stages. He used "ilon abscess salve," and on dry exfoliative cases liquid paraffin. Mr. KENNEDY HUNTER (Belfast) wished for more information from Mr. Brown about the haemorrhagic cases with a bulla on the tympanic membrance. This often occasioned some deafness, making it difficult to exclude trouble in the middle ear. In furunculosis he advocated tight packing with 8 per cent. aluminium acetate to abort the early case. Mr. J. R. WHEELER (Belfast) recommended prontosil in streptococcal cases. Mr. F. C. W. CAPPS thought that two facts were of importance: (1) the avoidance of surgical incision; and (2) careful personal supervision, preferably in hospital or in a nursing home. An otitis externa might prove far more intractable and painful than an otitis media, and it was wrong to treat such cases as out-patients. No one had mentioned magnesium sulphate paste. He always used it on nicks in the meatus, and it not only alleviated the condition present but prevented subsequent cross-infection of the opposite wall. Ung. hyd. ox. flav. was helpful in the dry and eczematous cases, and also as after-treatment in cases of boils.

The Audiometer

Mr. R. R. WOODS (Dublin), in a paper on the audiometer in clinical otology, said that his work had been done on a Western Electric No. 2B arranged in octaves covering the band from 64 to 8192 cycles per second. The accuracy of this audiometer had never been questioned, but objections had been raised to its application in clinical otology. His paper was mainly directed to the refutation of the conclusion of the Hearing Tests Committee of the Royal Society of Medicine, published in 1933 and apparently condemning the practicability of

the audiometer in clinical practice. By an excellent series of graphs Mr. Woods showed that accurate diagnosis and therapeutic progress could be more easily measured by an audiometer than any other way.

Mr. T. A. CLARKE (Canterbury) congratulated Mr. Woods on his clear exposition of the present uses and future potentialities of the audiometer. He was interested to know if Mr. Woods had found an explanation of the discrepancy between air and bone conduction in the high tones on the monochord. As a member of the Hearing Tests Committee he would defend its attitude. It had met in 1929, and in days of rapid electrical progress its report reflected the opinions of 1929 and not of 1937. It was unfortunate that its report was not published until 1933. Now even the machine used by Mr. Woods was out of date, and he himself, who in 1929 was against the practical use of audiometery, was purchasing the latest model for private and hospital use. Mr. GRAHAM BROWN asked if the instrument was of practical clinical use. If it was they should use it; if not, they should not allow instrument makers to take diagnosis out of their control. Dr. H. C. P. SMITH thought there was an opening for team-work between the otologist, the physicist, and an experimental psychologist. Mr. JOBSON, Mr. KILLEN, Mr. WATSON, and Mrs. BEATRICE H. LYNN (Belfast) also spoke.

Mr. WOODS, in reply, said that the only practical disadvantage he knew was the time the method took. It was no short cut to diagnosis. The discrepancy with tuning-fork findings was a matter of pitch and intensity. Any tone might be heard if it is intense enough. The trouble with aids was the cumbersome nature of those which were efficient.

SECTION OF RADIOLOGY

Wednesday, July 21

Tomography

With the President of the Section, Dr. J. C. RANKIN (Belfast), in the chair, the proceedings opened with a paper by Dr. E. W. TWINING (Manchester) on tomography.

Defining tomography Dr. Twining said that it was a means of obtaining clear radiographic definition at a deep plane by blurring of superimposed shadows. This was accomplished by moving the film and the *x*-ray tube during exposure in such a way that the image of object in a selected plane should be held in the same position on the film, while objects on other planes were blurred by the movement. The speaker showed diagrams and a photograph of his apparatus. Tomography not only helped by blurring the details of superimposed structure, but was valuable because it increased contrast. As an illustration an experiment was quoted in which a thick coin was placed at a small distance from the film, and a thinner coin between it and the film. The thin coin was invisible in a normal radiograph, but a tomogram, by blurring the shadow of the thicker coin, revealed the thinner coin, whose edges were well defined because its shadow always fell on the same part of the film. Films were shown demonstrating the value of tomograms in delineating various bony structures. In the spine the tomogram was useful in blurring the superimposed rib shadows in Pott's disease with kyphosis, and in the dorsal spine heart and lung shadows were removed by this means.

There was a rich field for tomography in lung conditions, as had been shown by various workers. The main lines of investigation in the speaker's work had been the demonstration of cavities and the study of the bronchi. Tomography revealed vascular shadows much more clearly than in a normal radiograph. This made it easier to localize certain lesions, and was useful in differential diagnosis, particularly between abscess cavity and peripheral neoplasm. In pulmonary tuberculosis tomography revealed conditions which were often obscure in the normal radiograph. Dr. Twining demonstrated a large number of films of the chest to illustrate the difference between normal radiographs and tomograms.

Dr. A. E. BARCLAY (Oxford) said that the method had great possibilities, particularly in chest conditions. It might also be of great value in the pelvis. Professor JOHN BEATTIE remarked that in his experience of tomography in animals it was not possible to make sections at intervals of less than half an inch, and he found this satisfactory. German tomographic apparatus was very expensive, and he would be glad to know of a cheaper method. Dr. R. MAITLAND BEATH (Belfast) referred to the value of tomography in showing the relation between the symphysis and the sacral promontory. Dr. BARCLAY asked what was the length of exposure and the travel in the tomograms Dr. Twining had shown.

Dr. TWINING, in reply, agreed that tomography was useful in pelvic measurement. Sections at half-inch distances had proved satisfactory in the human subject. The exposure was usually two seconds, and the maximum travel in his apparatus was fourteen inches. He proposed to increase this. For bones a small travel of three to four inches was enough. In answer to a question from Dr. T. G. HARDMAN (Dublin) Dr. Twining explained his method of adjusting his apparatus for different planes by means of diagrams.

Nomogram for Radiography

Dr. A. B. MACLEAN (Glasgow) read a paper on nomogram for radiography. The nomogram was based on Rhinebort's "basic roentgenographic technique," which correlated kilovoltage to the thickness of the part of the body concerned. There were two techniques: that in which current, time, and distance were constant, and the voltage altered according to the thickness of the part; and that in which current, voltage, and distance were constant and the time varied. The data had been obtained from a series of radiographs taken through paraffin-wax phantoms. Dr. MacLean showed a slide of the nomogram, which consisted of three columns: time of exposure, thickness of tissue, and kilovoltage. A standard distance of twenty-seven inches had been used in drawing up the nomogram, but a supplementary table was available for making the necessary correction for other distances. By drawing a line on the nomogram between the kilovoltage used and the thickness, and producing the line as far as the exposure column, the necessary time of exposure was indicated (voltage-thickness technique). The time-thickness technique could also be used if desired. The nomogram had been used in connexion with fifteen machines and applied to them all. It was found that the output of all these machines was the same per milliampere. The nomogram had been devised for bone work, and it was necessary to make corrections in the time or kilovoltage for soft tissues. It had been possible by means of the nomogram to achieve a degree of standardization of technique hitherto unobtainable. Dr. MacLean showed an exposure calculation which translated the nomogram into an easily portable and simple form.

Dr. GRACE BATTEN said that it was difficult to remember so many facts, and she hoped the paper would be published. Dr. C. L. MCDONOGH (Dublin) said that he had received a copy of the nomogram from Dr. MacLean, and that it had worked with uncanny precision. Dr. F. G. GREENWOOD (Blackpool) said he had used the method for two years and had found some difficulties, such as estimating the thickness of the chest wall and in skull work. In ordinary bone work it was very reliable.

Dr. MACLEAN, in reply, said that in order to solve the problem of thickness of chest wall he classified his patients as regards their bulk and made alterations accordingly. Dr. R. E. ROBERTS (Liverpool) referred to the

difference between fat and muscle in such calculation, and doubted whether photographic effect was the same at different voltages.

Radiology in Obstetrics

Dr. C. L. MCDONOGH (Dublin), in a paper on radiological diagnosis in obstetrics and gynaecology, said that by radiological means pelvimetry and size of the foetal head could be gauged without anaesthetic or pelvic examination. Diagnosis was rarely possible before the end of the twelfth week of pregnancy. Introduction of gas into the peritoneum to increase contrast was dangerous and unnecessary, but introduction of gas into the colon was often helpful. Radiography was valuable in the diagnosis of hydatidiform mole and of extra-uterine pregnancy. In suspected multiple pregnancy care should be taken to include the whole abdomen in the radiographic field. Radiographic demonstrations of foetal deformity at five to six months might avoid much suffering. In cases of foetal death maceration could be shown early in pregnancy, and, later, Spalding's sign. Injection of opaque material into the uterus before radiological investigation of suspected placenta praevia was dangerous, but uroselectan in the bladder was sometimes helpful. The value of *x*-ray pelvimetry and foetal cephalometry was not yet fully recognized by obstetricians. In the last three groups of Tweedy's classification, where the true conjugate was less than three and a quarter inches, it was useless to proceed to cephalometry, because Caesarean section was inevitable. In Groups 1 and 2 cephalometry was of great value after the thirty-second week because the biparietel diameter increased 0.1 inch per week after that time. If the pelvic measurements were known by pelvimetry the combined information was invaluable. He was certain that eventually every pregnant woman would be subjected to radiographic pelvimetry when first seen.

Dr. R. S. MACHARDY (Portsmouth) said that many obstetricians thought that the taking of radiographs was bad for pregnant women. He had recently investigated the dose received, and had found it so low as to be negligible. Dr. J. F. BRAILSFORD (Birmingham) said that it was a good sign that many wives of medical men were now having radiographic pelvimetry done. Dr. R. E. ROBERTS (Liverpool) said that change of position of the foetus might be very rapid, and caution was therefore needed. Amniography sometimes caused abortion, but not foetal injury. In cephalography there were two factors which could not be determined—amount of movement of the skull bones and force of uterine contraction during labour. A lateral view, including the lumbar region, gave a better idea of the relation of the symphysis to the pelvic brim.

Distance Mass Radiation

Mr. STANFORD CADE demonstrated a cinematograph film illustrating the evolution of distance mass radiation at the Westminster Hospital. The film included details of six mass units used since 1929, and showed their construction and application to patients. The latest unit contained 6 grammes. Accuracy of application, freedom from skin damage, avoidance of effect on general health, and results—particularly in pharyngeal and laryngeal cases—had all become better as the units had been evolved. It was now possible to deliver 9,000 *r* to a pharyngeal tumour at the rate of 9 to 10 *r* per minute without changes in the skin beyond erythema and without blood changes. Radium was becoming cheaper, and this method was therefore more economical than before.

Replying to questions, Mr. CADE said that there had formerly been some cases of delayed cartilage necrosis after treatment of the larynx and pharynx, but this had not occurred for five years. The response of the tumour to treatment was the only criterion, and no reliance was placed on skin erythema. Telangiectasis often occurred in the skin at a later date.

SECTION OF HYGIENE AND PUBLIC HEALTH

Wednesday, July 21

Enteric Fever

With Professor W. J. WILSON, President of the Section, in the chair, the discussion on enteric fever was opened by Dr. JOHN RITCHIE, whose paper was published in last week's *Journal* (p. 160). The subsequent discussion was, in the main, concerned with two aspects of the subject—namely, the practical control and the clinical manifestations and clinical treatment of the enterica.

Dr. S. WATSON SMITH (Bournemouth) ably summarized the clinical signs, methods of differential diagnosis, and the treatment of the disease. His paper was based chiefly upon observations made during the last year's outbreak in the adjacent boroughs of Poole, Bournemouth, and Christchurch. He called attention to the importance of the appearance of enteritis in an area. Such an area might soon be visited by an epidemic of enteric. He emphasized the resemblance of the early cases to acute appendicitis, and stressed the diagnostic importance of Lesieur's sign. In treatment, careful and adequate diet, the prevention of salt depletion, hygiene of the mouth and nose, attention to the fluid balance, were all critically discussed. Serum therapy had given equivocal results in his hands. He believed that serum treatment was the ideal, but that the suitable serum had yet to be found and made readily available. Repeated blood transfusion, perhaps immunotransfusion when possible, was of greatest benefit in haemorrhage or toxaemia, or in a prolonged or relapsing attack of typhoid. Dr. Watson Smith ended with a word on typhoid death, usually believed to result from the myocardium "petering out" from poisoning, but which seemed to him to be due to neuro-circulatory failure, in its turn produced by poisoning of the bulbar centres, similar in many respects to that which caused death in acute pneumonia.

Mr. A. FELIX described recent work upon the antigenic components of typhoid bacilli. He said that two antigenic elements had been shown to be present in therapeutically active sera. These were the O and the Vi elements. The Vi element was of great importance, was extremely labile, and was absent from commercial sera. To be active a serum must contain both of these elements. It was the Vi element which protected against the living organisms.

Dr. S. H. COOKSON (Bournemouth) gave an account of his experiences with the use of Felix serum. He had treated seventy-three patients with it, and believed that the serum was well worth using in all serious cases. He did not employ it as a routine. Lieut.-Colonel C. H. H. HAROLD, discussing water-borne typhoid fever, said that to-day immunity from typhoid depended in large part upon the sanitary methods taken to reduce the number of carriers. In modern life the danger had definitely shifted towards the small rural areas. He believed that the use of the lithium method to prove a connexion between a well and a stream was especially valuable. Dr. C. J. MCSWEENEY (Dublin) supported from his further experience the conclusion which he had already published, that the Felix serum treatment was a remedy of real value. Dr. A. GARDNER ROBB (Belfast) remarked that the abolition of 72,000 privy middens in Belfast many years ago had been followed by a remarkable fall in the case incidence of typhoid. But there was a corresponding fall all over the rest of Ulster at that time. Dr. R. J. MAULE HORNE (Poole) made an especial plea for a co-ordinated policy between the local Divisions of the B.M.A. and the local authorities regarding the hospitalization of patients. He believed that hospitalization was necessary in the interests both of the patients and of the community. Dr. GEORGE CHESNEY (Poole) paid a special tribute to the value of Wilson's medium. He described in an interesting fashion the possible sources of infection in the Poole epidemic. Cows

could have infected the milk directly from their teats after walking in the flooded waters of the infected stream. Or it was possible that the community was infected through a cow which died of malignant abortion on August 1. Or, finally, there was the possibility that cows which had become infected were excreting living typhoid bacilli in their stools. All of these points demanded careful inquiry and research. Dr. J. D. ROLLESTON remarked that it was interesting to observe that no clinician had advocated the use of alcohol in treatment.

An interesting paper was presented by Dr. F. MAY ERSKINE (Belfast) on the incidence of goitre in school children in Ulster. The incidence of these cases was related to water supply, to economic position, and to the nearness of the homes to the sea. A higher incidence was universally observed among girls than among boys.

SECTION OF TUBERCULOSIS

Wednesday, July 21

Tuberculosis in Hospital Workers

With the President, Dr. JOHN R. GILLESPIE (Belfast), in the chair, Dr. PETER W. EDWARDS (Market Drayton) opened a discussion on tuberculosis in hospital workers.

Dr. Edwards pointed out that facts concerning the incidence of this disease in hospital workers were still scanty. At the end of this year, however, the Registrar-General would provide the mortality figures among nurses and thus enable comparison to be made with women in other occupations. Investigations had been carried out abroad, and Dr. Edwards referred to those published in Scandinavian countries and in the United States. The incidence had been found higher in nurses than in the general population, and it was generally agreed that it was higher in nurses working in general hospitals than in those working in sanatoria. He thought, too, that far too many "residents" and students in their final years developed the disease. It was insufficiently realized that the personnel of tuberculosis institutions were in the position of true contacts. Prophylactic precautions should therefore be taken by them as by other contacts. The danger of spitting was still inadequately realized. In general hospitals there was much danger from patients, admitted for other conditions, who might be suffering also from pulmonary tuberculosis. Hence every patient should on admission have his sputum, if any, examined for tubercle bacilli, and his chest *x*-rayed. The speaker then dealt in greater detail with the danger in nurses. He deplored the conditions under which they still worked in many institutions. Even a forty-eight hours week was too strenuous for girls during their training, when they also worked for examinations. Once "qualified," they should have the same freedom as women in other occupations. At the sanatorium of which he was in charge the trained staff lived in a hostel outside the institution run entirely by themselves. He stressed the personal hygienic precautions that should be taken during work, particularly the importance of change of clothing immediately on leaving the wards. Tuberculosis in hospital workers should be treated as an industrial disease. Most medical superintendents were in favour of employing staff who had suffered from the disease. Dr. Edwards thought this might prove a better and cheaper solution of an urgent problem than many employment schemes and settlements.

Dr. J. WATT (Godalming) emphasized the possible danger of creating unnecessary alarm in the public mind and of fostering an impression that nursing was a dangerous occupation. He discussed the reasons why tuberculosis should be more common in nurses working in general hospitals than in those working in tuberculosis institutions. There was, however, a real danger of infection in the latter. This danger should be minimized by the teaching and practice of proper hygienic and prophylactic precautions. The general resistance should also be raised by good feeding and avoidance of physical and mental strain. He, like Dr. Edwards before him, thought that at the present time it was not justifiable to exclude tuberculin-negative girls from admission to the nursing profession.

Dr. ESTHER CARLING (Peppard Common) stressed the dangers of infection, and particularly of overstrain, in nurses. It was the duty of the medical profession to see that the unfavourable conditions under which girls now train should be altered. She suggested that the matter be taken up by the British Medical Association, working perhaps in conjunction with the Prophit Tuberculosis Trustees and the Joint Tuberculosis Council.

Dr. MADGE MACKLIN (Western Ontario) described conditions in Canada and the results of a questionary which she had sent out. Her remarks gave the impression that Canada was ahead of England in the care taken in choosing girls for training and in the conditions under which nurses worked, and were looked after if they broke down.

Dr. R. MARSHALL (Belfast), speaking from the viewpoint of the general physician, described the experience in Northern Ireland. His investigation, the results of which he gave in full, were based on (1) inquiries from doctors in charge of sick nurses or from matrons of the principal hospitals, and (2) the case-records since 1922 of the Befast Municipal Sanatorium and the Forster Green Hospital, Belfast. It was certain that almost every nurse who had been diagnosed as suffering from pulmonary tuberculosis in the hospitals of Belfast had been sent to one of these institutions. He concluded that a girl beginning work in a hospital was exposed to a certain risk of tuberculosis. He indicated the precautions that should be taken.

Early Diagnosis of Pulmonary Tuberculosis

The chair was then taken by Mr. J. E. H. ROBERTS, and Dr. GEOFFREY MARSHALL opened the discussion by referring to the difficult position of the general practitioner in connexion with this "troublesome problem." He stressed the fact that a physical examination alone was most unreliable in detecting the early lesions of pulmonary tuberculosis. More fruitful results were, however, obtained when a careful inquiry was made into the past history of the patient, particularly with reference to contact and when pains were taken to elicit symptoms. Such symptoms required careful assessment, since in the earlier stages of the disease they were those of toxaemia and therefore non-specific. One symptom, in the absence of all other evidence, must be considered diagnostic—a free haemoptysis "out of the blue." Dr. Marshall, discussing diagnostic measures, referred to the method of culture on Loewenstein's medium and radiological examination of the chest: "the wise physician will view and discuss these appearances with the radiologist; the wise radiologist will leave the responsibility of diagnosis to the physician." The third important investigation was the diurnal record of the temperature. He finally drew attention to the observation of Wingfield and Macpherson that radiological examination disclosed that about one in every hundred apparently healthy adolescents in factories and workshops had tuberculous lesions in the lungs. He would like to press for the routine periodic *x*-ray examination of nurses, students, and young girls in factories.

Dr. L. S. T. BURRELL stated that what was needed was some method which would indicate the dividing line between mere infection and actual disease. Pulmonary tuberculosis showed itself as an acute, a subacute, or a chronic disease. Examination of the sputum was always of the greatest importance. Absence of tubercle bacilli in sputum that was definitely mucopurulent was highly significant. He strongly recommended the laryngeal test when sputum could not otherwise be obtained for examination. Dr. M. F. O'HEA (Dublin) stressed the impor-

tance of co-operation between the radiologist and physician in interpreting radiographical appearances. The radiologist should always be provided with a full history. It was essential to be familiar with the limits of what constituted a normal film. A period of observation followed by further *x*-ray examination should be practised more often. He showed slides illustrating the radiological diagnosis of "early" lesions in the lung. Dr. J. A. L. JOHNSTON (Londonderry) said that the increase in *x*-ray examinations had exposed the imperfection of the methods of examining the sputum generally used. Many specimens sent for examination were unsatisfactory for this purpose. The physician should be responsible for the collection of suitable specimens. He praised highly the laryngeal mirror test (or merely the use of a slide in a similar manner). The combined gasolene concentration method (as described by Peter Edwards and his co-workers) and culture on a modified Loewenstein medium gave the best results. He thought the subcutaneous tuberculin test dangerous.

The PRESIDENT spoke highly of the value of the subcutaneous tuberculin test. He had carried it out in over a thousand patients and had never seen any disastrous result. Dr. M. ASTON KEY (Southsea) asked how much value should be placed on the pulse rate and on the finding of a small vertical heart in the skiagram. Dr. ANDREW J. MORLAND described a case in which he had found the subcutaneous tuberculin test useful. Mr. J. E. H. ROBERTS stressed the point that other conditions apart from pulmonary tuberculosis might cause a sudden large haemoptysis—for instance, congenital cysts of the lung.

Local News

SCOTLAND

Congress of Medical Women

The fourth congress of the Medical Women's International Association met in Edinburgh from July 13 to 17, and was attended by some 300 delegates from twenty-three countries. This association was inaugurated in New York in 1909, and has held congresses in London, Paris, and Stockholm. The chief scientific subjects discussed at Edinburgh were cancer in women and its prevention, and maternal mortality and abortion, and the meetings were held in the medical buildings of the University. At the inaugural meeting in the McEwan Hall, when Dr. Alma Sundquist of Sweden presided, Sir Thomas Holland, vice-chancellor of the University, in welcoming the delegates, said that they met under a very different mental and spiritual condition from that which Sophia Jex-Blake found sixty-nine years ago. Edinburgh University's association with the development of medical education for women had begun in 1868, when Sophia Jex-Blake tried to gain admission to the University. She and a few kindred spirits were admitted to some classes and not to others, and distinguished themselves in those examinations for which they were permitted to sit, but failed to get the formal recognition necessary to qualify. Four years later in the Court of Appeal the judges decided by a majority that Edinburgh University had exceeded its powers in framing regulations for the admission of women medical undergraduates. Edinburgh thus lost a fine opportunity through the strange ways of the law, and not till twenty years later did the University, under the clearer powers provided by the Act of 1889, frame regulations for the admission of women to medical graduation. Until 1916 it acted purely as an examining body for women students, who received their training outside its walls; this had been partly due to lack of sufficient accommodation. In the last twenty years nearly 600 women medical students had qualified at Edinburgh. Dr. Sundquist, in her inaugural address, said that the association had been founded so that women doctors in all parts of the world might benefit from each other's experience, knowledge, and views. Health was now progressing, the duration of life was increasing, and the death rate was decreasing. Cancer was an important cause of death in women, and large groups of women hesitated, often for too long, before consulting male doctors. Maternal mortality was largely a question of health education, and could in many cases be prevented by suitable advice; women doctors should therefore interest themselves especially in this educational work. At the meeting on July 15 Dr. Simone Laborde, from the Cancer Institute, Paris, said that almost all countries had adopted energetic anti-cancer campaigns. The mortality from cancer had risen in every country during the past ten years, and in Switzerland the incidence of the disease was higher than in any country in Europe. The increase in the death rate from cancer was not due merely to increased longevity. There was no exact evidence that heredity played any important part in its production, but disorders of certain glands with internal secretions might be factors. Special instruction of medical students and doctors was of greater importance at the present time than widespread propaganda, but Toulouse University was the only one which at present had a special chair of "Cancerology." Dr. Elizabeth Hurdon of the Marie Curie Hospital, London, said that the problem of the prevention and cure of cancer was one of the most pressing of our time. In no field of medical research had so much been discovered within recent years. New methods of diagnosis and further advances in treatment were being developed in every part of the world, and in most universities workers were investigating some aspect of the cancer problem. In Great Britain cancer of the breast was the most common form in women, and earlier diagnosis was a matter of vital importance in treatment. There had, however, in the last two decades been a remarkable decrease (21 per cent.) in cancer of the uterus, but theories to account for this change were still speculative. It was known that pure chemical substances applied to the skin could produce cancer in animals, and that cancer of the breast and uterus could be produced by injection of oestrogenic hormones. These discoveries seemed to offer convincing evidence that hormone imbalance was an important contributory factor in the cause of this disease. It was difficult to assess the results of the propaganda regarding early treatment, which had been carried on for some years, and it did not appear, in Great Britain at least, that there had been any improvement in the stage of development at which patients presented themselves for treatment.

A discussion on maternal mortality and abortion was opened on July 16 by Professor Bertha van Hoosen of Loyola University, U.S.A., who said that maternal mortality during the period 1929–34 had increased in Denmark from 32 to 39 per 10,000 of the population, and in England from 43 to 46. In the Netherlands it had decreased from 34 to 32, in Norway from 36 to 29, and in the United States from 70 to 59. In Japan, where high-school girls were taught about maternity, the figures stood unchanged at 28. Abortion was considered a crime in all the English-speaking countries, and in Holland, Sweden, Denmark, New Zealand, and Japan the women were punished as well as the abortionist by imprisonment. In the United States the abortionist was punishable in all States, but the women in Washington only. There were 681,600 abortions annually in the United States, with a death rate of 1.2 per cent., and these occurred chiefly among married women who had had several children. In the subsequent discussion Dr. Rhoda H. B. Adamson (Leeds) said that the question of the general condition of the child-bearing women who died did not seem yet to have been raised. A considerable proportion of mothers who died were women whose health should not have allowed them to have children; these women did not die of child-bearing, which was only the terminal condition.

Dr. Josephine Baker (U.S.A.) said that the high maternal mortality rate in the United States was mainly due to the fact that the midwife was ignored. At the closing meeting on July 17 Miss Louisa Martindale (London) was elected president for the next congress, which is to be held in Budapest in three years. It was decided to continue the discussion on maternal mortality and also to discuss nutrition and venereal disease.

Edinburgh Medical Graduation

At the Edinburgh graduation ceremonial on July 21 Principal Sir Thomas Holland conferred the M.D. degree upon twelve candidates and the degrees of M.B., Ch.B. upon 151 graduands. The honorary degree of LL.D. was conferred upon Dr. Edwin Bramwell, formerly professor of clinical medicine, and in presenting him, Professor H. H. Monteath said that he had inherited from his father, the late Sir Byrom Bramwell, an aptitude for skilful diagnosis and inspiring teaching. He had made peculiarly his own the subjects of encephalitis lethargica with its sequelae and relations, and the different types of myopathy. During his tenure of the chair of clinical medicine and as lecturer on neurology in the University his faculty for clinical exposition had been greatly appreciated, and the esteem and respect in which he was held by his professional brethren had been demonstrated by his election as President of the Royal College of Physicians of Edinburgh. Professor Sydney Smith, in an address on the necessities for change in the medical course, said the study of medicine had been the target for much criticism, and members of the medical profession had been the most ruthless critics. It had been said that medical education was devoid of cultural value, but the aim of any system of education was to build up the mind and character to foster the ability to think, and to cultivate the faculty of appreciation and discrimination. There could be no doubt that for these objects the study of medicine offered as ample a field for thought as any other. There was among the generation of new practitioners an impassioned revolt against the dead hand of the past. Those whom he addressed to-day formed the first group of "war babies" to graduate, and, brought into a world altered out of all recognition, growing up in a spirit of revolt and dissatisfaction, and lacking much of parental control, they had tended to lose faith. The effect could be seen in the modern attempt to find new outlets for intellectual and emotional stress, of which some were intensely interesting, some frankly pathological. This revolt was impossible in connexion with medicine or science, for the course of study did not consist of a chance collection of subjects studied haphazard, but of a carefully considered system built up from a solid foundation. There had been enormous advances in the physical sciences, and a steady but less spectacular progress in the biological sciences and medicine. As a measure of medical effort it might be observed that the mean expectation of life had lengthened by about ten years, the death rate had fallen by 33 per cent., the infantile mortality by 60 per cent., and the death rate from tuberculosis by 64 per cent. Deaths from cholera, plague, malaria, and typhus had practically disappeared from this country, and in the realm of surgery there had been similar advances. All the advances in medicine had had to be incorporated into the curriculum of study without adding to the time taken. This had been done, however, only by very careful adjustment, and naturally there had been difficulties, which continued to grow. The time had now come when an increase in the period of study must occur. The Senatus of Edinburgh University was now deliberating the extension of the course to five full years after the study of the fundamental sciences—that was to say, five years from beginning the study of anatomy and physiology. It was also considering the improvement of the standard of education by endeavouring to keep students at school until the age of 18. This implied the recognition of courses of instruction in chemistry and physics taken at school, and it would allow the study of general scientific subjects to be continued slowly and carefully over a period of years, placing them as subjects of equal cultural importance with others of general education. The advances in human physiology and biochemistry required for efficient teaching a considerable extension in space, equipment, and staff, which must be undertaken by the University in the near future. Many other changes were under consideration, and it was hoped that within a reasonable time it might be possible to provide for students a period of living-in at hospital, where they would be in regular attendance upon their own patients. It was hoped, too, that the dispensary system, which was a unique feature of the Edinburgh school, might be extended so that every student might be brought into personal contact with patients in their own homes, and thus become familiar with the operation of public services for the maintenance of health. A considerable amount of money would be required to give effect to this programme—about £500,000 to do all they wanted in the immediate future.

Glasgow Public Health Services

The Glasgow Public Health Department has issued an attractive pamphlet on "Nursing as a Career for Girls." It sets out carefully the details of training, registration, and conditions of service, as well as the opportunities open to a registered nurse according to her attainments and preferences—private nursing, hospital work with a view to promotion to responsible posts, specialization in such a subject as radiology, the task of nurse-tutor, the nursing services of the Army, Navy, and Air Force, district nursing (a sphere of steadily increasing importance), and municipal midwifery. Stress is laid on the increasing amenities of a nurse's life, the provision in hospitals for recreation, sport, and fellowship, the better adjustment of off-duty times, and, not least, a superannuated retirement. It is even suggested that the training for nursing is advantageous even although it is not intended to adopt the profession as a permanent career, and that nursing is a useful preparation for marriage and motherhood. From first to last there is no reference to Glasgow, but a leaflet is inserted setting out the fourteen hospitals under the administration of Glasgow Corporation and the scope of nursing training which they offer. The second of a series of combined clinics has just been opened by the Glasgow Corporation at Gorbals to serve an area of the city to the south of the Clyde. The building affords accommodation for maternity and child welfare services, education health services, dental and tuberculosis clinics, and a clinic for outdoor medical services in public assistance cases. The outdoor medical services are said to be particularly busy in this area, and four medical consulting rooms have been provided for this purpose. The maternity and child welfare clinic is designed after the most modern principles with a demonstration room for the teaching of mothercraft, a lecture room, and an ante-natal centre. The dental clinic consists of two dental surgeries equipped with up-to-date apparatus. The education health services are given a whole floor, with consulting rooms for general and special examinations, and an orthopaedic department. There is also a small clinic for the treatment of trachoma, a disease which in Glasgow is largely confined to the Gorbals area. The clinic is so designed that the different sections can function separately without interfering with each other. Almost every service has its own special entrance.

Edinburgh Dental Hospital

At the prize-giving of the Edinburgh Dental Hospital and School Lord Salvesen commended to the public an appeal which is now being made for £50,000 to extend the hospital and school. He said that dentistry was one of the few professions which was not likely to be overcrowded in the immediate future, especially if the scheme providing for the periodic examination of the teeth of all school children by a skilled dentist should be carried out.

The Edinburgh school had progressed enormously, and the municipality ought to recognize that it was a source of considerable income to the town as a whole and therefore give it support. It was the largest school of the kind in Scotland, and it had little income from outside sources, depending almost entirely upon the registration fees of the students and gifts which patients in the hospital might make. Lord Salvesen spoke of the great progress in dentistry during his own lifetime. It was of great advantage to health, he said, that people now went to a skilled dentist much earlier, for many diseases which had their origin in decayed teeth could be averted at an early stage but might be difficult to cure later. Poverty was now no excuse for want of dental attention. Mr. A. C. W. Hutchinson, dean of the School, said that necessitous patients came to the dental hospital from all over the south and east of Scotland, and the accommodation was quite inadequate. The governors had accordingly decided that the time had come when the old buildings comprising the back part of the hospital should be pulled down and a modern building erected in their place. The cost had been estimated at over £50,000, and for the greater part of this sum it would be necessary to rely on the generosity of the public. The number of students attending the hospital was now 257, of whom fifty-one were taking a medical in addition to a dental qualification.

ENGLAND AND WALES

Health of London School Children

The report of the School Medical Officer of the London County Council for the year 1936 (P. S. King and Son, Ltd., 14, Great Smith Street, Westminster, S.W.1, price 1s. 6d.) marks continued progress in the state of health of London children. In the last two or three years a new wave of interest and a fresh urge with regard to the children's health have been manifested—anxious concern having been shown for the children's nutritional well-being, for the progress of physical culture, and for improvement in environmental conditions both in and out of school. Considerable progress was made during 1936 in the Council's programme for the improvement and reconditioning of school buildings and equipment, and with schemes for the acquisition of playing fields. Reference is also made in the report to other amenities, such as gymnasia completely equipped and provided with changing rooms supplied with shower-baths, which are being introduced in schools. Close watch continues to be kept on the state of the nutrition of the children. At routine medical examinations of 184,733 children in their age groups a clinical assessment of the state of nutrition was made by the school doctors, assisted by continuous growth charts made by the school nurses, which showed that in 94.01 per cent. of the cases the nutritional state was satisfactory. Of the remaining 5.99 per cent. (comprising 11,057 children whose nutritional state was not wholly satisfactory) only 122 (0.07 per cent.) were found to be suffering from serious malnutrition. In many respects the physical condition of the children was found to be better than ever recorded before, notably in respect of cleanliness, discharging ears, and anaemia. The progress of the nutrition centres established in May, 1935, is recorded, and special attention is directed to this phase of school medical work in London. At these centres patient investigation is undertaken of children who are found by observation in the schools not to be thriving normally. Reference is made to the dramatic results obtained by sending the children to residential open-air schools for a few weeks. The progress of the work of caring for the maladjusted or difficult child is detailed under the heading of "Child Guidance." An account is given of the provision of nursery schools and the care of the infants. Nineteen nursery schools in London are now provided or aided by the Council.

Middlesex Hospital Medical School

At the annual prize-giving ceremony of the Middlesex Hospital Medical School Prince Arthur of Connaught, chairman of the hospital and medical school, presided, and Lord Dawson of Penn presented the prizes and medals to students and nurses. In the course of the proceedings the dean, Dr. H. E. A. Boldero, announced that Mr. Edward Meyerstein had presented to the school a new athletic ground at Chislehurst. Lord Dawson said that this gift would enable the students not only to enjoy recreation but to put themselves in the forefront of a fitter youth. No one needed to be fit more than did doctors and nurses. Medicine demanded the hardest work and gave the fullest life of any calling in the world. Their minds could never be dull in medicine, because they lived in a land of knowledge in which they were always trying to add something from the uncharted land all round. The ancillary services, of which the exponents in the Middlesex Hospital Medical School were outstanding in repute, were an invaluable aid, but they must be careful to hold the balance between those services and clinical medicine. The dean also reported that the medical school had received from an anonymous donor a sum to create a "Rudyard Kipling Fund" for helping students or recently qualified Middlesex men who might otherwise have to abandon a medical career. Dr. George E. Beaumont, physician to the hospital, delivered the introductory address, the title being "The Breath of Life."

Bournemouth's Sanatorium Hospital in the New Forest

Bournemouth recently acquired the private institution at Linford in the New Forest which had been carried on for a number of years by Dr. A. de W. Snowden. The corporation's plans provide for the erection on the site, which extends to 125 acres, of a modern well-equipped sanatorium hospital to accommodate at the beginning 100 or 120 beds. For the present the existing provision for about thirty patients is being utilized, the first patients having been admitted on May 1 last. When completed the new institution will afford accommodation and treatment for all types of cases—early, intermediate, and advanced. Linford is two miles from Ringwood off the Romsey Road, and fourteen miles from the Square, Bournemouth. The sanatorium will thus be situated in some of the loveliest country in the south of England, and its position on a slope facing south-east with protection from the north-east and south-west will make it ideal summer and winter for the purpose for which it is intended.

South-Eastern Regional Committee on the Deaf-Blind

The South-Eastern Regional Committee on the Deaf-Blind publishes a report of the preliminary survey undertaken during 1936 of the problem presented by the deaf-blind in London and the South-Eastern Counties. The proportion of blind persons in this area who are also deaf is stated to be approximately 6 per cent., representing a total of roughly 1,110 deaf-blind persons. The grey existence of these doubly afflicted people, whose lives are necessarily painfully isolated, can be lightened by friendly visitors of the right type, especially those with some knowledge of the psychology of the deaf, or, preferably, of the deaf-blind. For such visitors extreme patience and a capacity for listening are the most desirable qualities. The report also points out the need for correlating the functions of whole-time, part-time, and voluntary workers and the work of general administration. The desirability of the careful examination of the deaf-blind by aural specialists is also stressed, followed by a thorough trial of types of aids to hearing. It is further suggested that cases of defective hearing among the blind should be systematically examined as early as possible with a view to preventing, or at least delaying, the onset of more advanced deafness. Copies of the report are obtainable from the joint secretaries at 66, Victoria Street, S.W.1, and 96, Bramfield Road, S.W.11

Correspondence

The Abuse of Caesarean Section

SIR,—After an experience of examining during many years I am appalled by the increasing tendency for students to answer any question on complicated labour by the simple formula "Do a Caesarean section." Recently a question on a transverse lie with a prolapsed arm was answered by many of the candidates in the same way, some emphasizing that this should only be done if the uterus was in tonic contraction and version could not be carried out.

Now if Caesarean section was a really difficult operation like Wertheim's hysterectomy, I should not be worried, knowing that it would not be attempted; but it is the simplicity of the Caesarean operation that makes it so dangerous. That there are thousands of unnecessary Caesareans performed is serious enough in itself since it raises the risk of death to the patient from 4 per 1,000 to 1 per cent., but when it is carried out as a last resource the risk to the mother is appalling. We teachers of midwifery must realize our responsibility in discussing Caesarean section with students.—I am, etc.,

London, W.1, July 23. MALCOLM DONALDSON.

Anaesthesia in General Practice

SIR,—I was interested to read Dr. Helen Lukis's article on the choice of anaesthetic in general practice in the *Journal* of July 17 (p. 126). I have been in general practice for nearly fifteen years, and I have given altogether 8,900 anaesthetics, of which rather more than 1,000 were administered before I qualified. I should like to make a few observations on the subject. First, with regard to avertin, I have found this drug to be ideal as a pre-anaesthetic medication when it is not given in doses sufficient to produce surgical anaesthesia, and I think Dr. Lukis has magnified the disadvantages attending its use. May I take these seriatim from her article?

In the first place, I think anaesthetists are now generally agreed that avertin should be used only as a pre-anaesthetic drug, and that when used in this way it is usually safe, except in cases in which it is obviously contraindicated. In the second place, the 500 c.cm. and 10 c.cm. measuring cylinders, glass flask, and thermometer can all be kept in an ordinary cupboard or on a shelf in a dispensary, and with care they are not more breakable than other glass apparatus. Thirdly, the dosage table provided by Bayer and Co. is perfectly simple and reliable, since it gives the quantity of distilled water and avertin fluid required for any given weight.

I always make up the solution at home at any convenient time within two hours of its intended administration. This time limit was given to me by a very well-known London anaesthetist, who was one of the first to use the drug in this country, and who has used it extensively since its introduction. It takes me about ten minutes to make it up, put it in a vacuum flask, and put away the apparatus. I will admit that until I was familiar with the routine I took a full twenty minutes. If the patient is a child I then take the flask to the nursing home, and leave it for administration by the nurse half an hour before the time of operation. Any recently qualified nurse is familiar with the drug, and even if she is not it is a very simple matter to run about 225 c.cm. of fluid from a vacuum flask into the rectum by means of a No. 10 or No. 12 catheter, a tube, and a funnel. If the patient is an adult I see him first and give it myself, so that he does know that I have in fact been present. This would be particularly desirable just now in case the patient had lately read Dr. Cronin's latest novel.

Lastly, with an ordinary Centigrade thermometer in a rubber stopper in the flask used for heating the water it is quite simple to ensure heating to the proper temperature; and in case this is forgotten it is noted on the dosage table already mentioned. I completely fail to see that avertin is a "very dangerous weapon in the hands of the family doctor" provided that a little trouble is taken in becoming familiar with the necessary procedures.

Dr. Lukis again, I think, is hardly fair to gas and oxygen, which, as everyone agrees, is by far the safest inhalation anaesthetic we possess. With two fifty-gallon cylinders of nitrous oxide and an oxygen cylinder there is ample material for at least two long major operations, especially if avertin has been given first; and it is possible nowadays to get really portable apparatus, such as a "Boyle's bottles" unit with a sight-feed bottle instead of flowmeters. This is not prohibitive in price nor difficult to keep in good working order. Admittedly, the whole apparatus is less portable than a bag containing a mask, a bottle of chloroform, and a bottle of ether, but the extra time and trouble taken are well worth while in avoiding the post-anaesthetic effects of chloroform and ether.

Another point to bear in mind is that in these enlightened times, when the medical profession is unfortunately not enjoying a "good press," the average intelligent layman knows almost as much about recent advances in medical knowledge as we do ourselves; and when he reads in his morning paper a glowing account of some wonderful drug or appliance which makes anaesthesia pleasant and easy, it behoves us, as family doctors, to be conversant with it; and, moreover, he will certainly expect us to be so! I find that during the last year or two an increasing number of patients are actually asking to have avertin given to them if they have to undergo an operation.—I am, etc.,

Coulsdon, Surrey, July 23. R. B. P. LANSDOWN, M.B., B.Ch.

Hermaphroditism

SIR,—In the light of Mr. H. Chapple's recent article on hermaphroditism (*Journal*, April 17, p. 802), a case which came under my care at the Royal Hospital, Richmond, some years ago might be of interest.

A woman, aged about 32, was sent to me with a diagnosis of "imperfect vagina." She was well developed, of average height and with normal breasts. Moreover, she was anxious to have a child, although she had never menstruated nor experienced sexual desire. On examination the external genitals were found to be normal, the vagina being about three inches long, but no cervix or uterus could be felt. I communicated with the patient's doctor, and left the matter in his hands. About four weeks later the woman was admitted to the hospital suffering from appendicitis. In the course of the operation the following extraordinary condition was made manifest.

The uterine body was represented in the mid-line by a small round nodule one-third of an inch in diameter. From either side of this structure two solid, rounded, elongated bands of tissue, looking like uterine muscle, stretched out round the pelvic brim. These bands gradually increased in diameter to about one and a quarter inches at the distal end. Fastened on to each end was a large glistening white structure which I took for unusually large ovaries. Along the outer side of each of these was a minute tubule, ending in two or three tiny strands of fimbriae of the Fallopian tube. There was

attached to each a small mobile cyst of Morgagni. The round ligaments were three-eighths of an inch in diameter continuous with the bifurcated uterine bodies and passing to each internal abdominal ring.

It appeared as if a bicornuate or didelphys uterus had been intended by Nature. Pathological examination showed that the elongated structures were composed of uterine muscle, both white bodies were normal testicles, and the tubules were vestigial Fallopian tubes without cilia.—I am, etc.,

Richmond, Surrey, July 24. JOHN W. HEEKES.

Tests for Renal Function

SIR,—I read Dr. C. S. D. Don's article on tests for renal function (*Journal*, July 10, p. 54) and his conclusions with interest. Dr. Don suggests that the different methods in use may test different renal functions, and in part I believe this to be true. During the last two and a half years I have been engaged in an investigation of the renal state in regard to the disorders of pregnancy and the puerperium, using both the urea clearance test and the older "concentration factor" test. I have used this older method because I am convinced of its value in the assessment of renal damage when the later test alone will fail to find it on account of an existing compensatory diuresis.

In a series of about seventy normal pregnant women the concentration factor has always been the normal 50 or more under standard conditions, the clearance well over 70 per cent. I have therefore assumed that in cases of pregnancy toxaemia of the various types a low concentration factor has indicated renal damage—according to the established view that one of the first signs of renal damage is impairment of this concentrating power—even when the clearance has been normal or over. This accords well with the known flexibility of renal function as expressed, for example, by Fishberg: "The factor of safety of the kidney is so great, its compensatory mechanisms of such great moment, that these changes [disturbances of renal function] are often far from obvious. I have come to believe that the concentration factor, though merely a test of the concentrating function of the kidney, is of value in indicating existing damage, and that the urea clearance test, a test of nitrogenous excretion, is of particular value in estimating the degree of compensation present.—I am, etc.,

Leeds Maternity Hospital, July 24. NORMAN LISSIMORE.

When to Operate in Appendicitis

SIR,—Mr. R. J. McNeill Love's statement that a circumscribed swelling in the right iliac fossa in association with acute appendicitis is an abscess (*Journal*, July 24, p. 184) requires some qualification, particularly as it is a criterion of operability to the exponents of the Ochsner-Sherren treatment; in some cases that I have operated on the "circumscribed swelling" palpated before operation has proved to be either a mass of inflamed omentum or an indurated caecum. It has not been my experience that in three months after the acute attack has subsided "freedom from adhesions is remarkable"; in those cases in which the conservative method has been followed I find that a six-months interval is nearer the mark.

Further, that "efficient expectant treatment can only be carried out in a nursing home or hospital where the patient is under constant supervision of the surgeon" is a statement vitiated by its ending. If the Ochsner-Sherren treatment is so good surely the family doctor is capable of carrying it out and evaluating the signs which call for its abandonment. Surely it is a simple matter for the surgeon to open an appendix abscess in the patient's home. After all, an operating theatre is just four walls and a roof; it's the technique that matters.—I am, etc.,

R. RUTHERFORD, F.R.C.S.

Longtown, Cumberland, July 24.

Defective Hearing

SIR,—May I reply to Mr. A. Lowndes Yates's criticism (July 10, p. 90) of my article published in the *Journal* of July 3 (p. 18), and to that of Dr. James Kerr in the issue of July 17 (p. 135).

The ordinary conversational voice, as everyone knows, cannot be standardized. The response to this test varies according to the voice of the individual who is conducting the test, quite apart from environmental conditions; but it is possible for anyone engaged in frequent testing to develop a fairly constant "ordinary conversational voice" for the purpose required, and thus create a rough standard for this test.

I quite agree with Mr. Lowndes Yates that all these tests—the ordinary conversational voice, the pure tone audiometer, and the gramophone audiometer, etc.—should be conducted in a silent place, but unfortunately this is not universally possible at present. For example, the gramophone audiometer tests of school children must be conducted under ordinary class-room conditions. Accordingly, the ordinary conversational voice tests and the pure tone audiometer tests are conducted as nearly as possible under similar conditions, although in the pure tone test the meatus of the ear that is not being tested is occluded. As a matter of practical experience, with my own "ordinary conversational voice" and under the conditions stated, I find that a child who can repeat unfamiliar phrases at not more than twenty feet distant gives a loss of about 35 decibels over the main speech area (512–2,048 d.v.). With better conversational hearing than twenty feet the loss by the pure tone audiometer test shows something less than 35 decibels. Further, with conversational hearing at two feet only the pure tone audiometer test shows a loss of about 55 decibels over the main speech area. I have found in a considerable number of tests that this relationship between the response to the ordinary conversational voice and the pure tone audiometer is remarkably constant, and these two levels of hearing response form my boundaries between Grade I and Grade II in the first instance, and between Grade II and Grade III in the second, so far as the hearing qualification is concerned.

Mr. Lowndes Yates says, "If we assume that the ordinary conversational voice can be heard at a maximum of fifty feet, to hear at twenty feet shows a diminution of hearing power of about 6 decibels, but we are also told that the hearing loss with the pure tone audiometer is 35 decibels in this grade." I do not know why he assumes that the ordinary conversational voice can be heard at a maximum of fifty feet only. Harvey Fletcher has made careful investigations on this point and finds that the ordinary conversational voice can be heard at 1,250 feet. Mr. Lowndes Yates correctly says that a loss of 35 decibels with the pure tone audiometer means that the hearing distance is diminished to about one-fiftieth of the normal. One-fiftieth of 1,250 feet is 25 feet, which is surely getting very near to my own figure of 20 feet, and "about one-fiftieth" (his own words) might even bring it to exactly that figure.

With regard to the letter of Dr. James Kerr, who has always taken such a great interest in the welfare of the deaf, I agree that the number of persons coming within the scope of a Deaf Persons Act would be determined by the restrictions of such an Act. It seems to me, however, that an Act should not only embrace the 30,000 so-called "deaf and dumb" but also those severely deafened persons who would suffer from extreme handicap in their struggle for existence in competition with their more normal fellows—in short, those whose hearing defect is covered by my Grades IIb and III. The great difficulty is to get an accurate idea of this number.

My object was to estimate an outside figure within which this number would probably fall, so that the full nature of the problem would be indicated and a basis for further consideration arrived at. If an Act contained restrictions limiting its benefits only to the persons of Grade III type and to the more seriously deafened in Grade IIb, my outside figure of 150,000 would certainly be reduced to well under 100,000, but I consider an Act which covered only the 30,000 "deaf and dumb" in the country, while better than nothing, would not meet the needs of all the severely deafened and handicapped people.—I am, etc.,

Medmenham, Bucks, July 20. ARTHUR G. WELLS.

Ionization for Hay Fever

SIR,—I feel that there are one or two points in Dr. J. Adam's letter in the *Journal* of July 10 (p. 88) which cannot pass without comment.

First, he says that "some fibrinous exudate is troublesome for the first few days after treatment, but it is probably this and weakened ciliary action that explains the benefit." Now surely zinc ionization produces a protective film of zinc albuminate, thus limiting the absorption of the pollen proteins by the nasal mucosa. We know, too, that the most important function of the ciliary stream is the removal of mucus-entangled bacteria, dust, pollen, etc.; and that prolonged contact of these substances with the allergic mucosa serves to increase its sensitivity towards the specific allergen. Yet Dr. Adam would appear to suggest that weakened ciliary action plays a part in the beneficial effects of ionization.

Again, he says that "American writers have imputed ciliary damage to ionization. Such damage I have not seen, though it may conceivably happen from over-treatment." A study of the pathology of hay fever will show that metaplasia of the epithelial cells in varying degree, with replacement of the columnar cells by stratified cells and absence of cilia, is a constant feature in hay fever. So, while I agree with Dr. Adam that it is wrong to attribute permanent ciliary damage to ionization, except possibly as the result of over-treatment—or, more probably, the passage of too strong a current for too long a time in the presence of too strong a solution of zinc sulphate—I find it a little difficult to picture the nose of the medical patient referred to by him as being "quite normal" when "he returned for treatment before the beginning of this season."

Lastly, I cannot agree with him as to ionization being "mostly futile" for paroxysmal rhinorrhoea. It has been my experience, and apparently the experience of the vast majority of British and American writers, that ionization is of greater benefit for paroxysmal rhinorrhoea than for hay fever, but that in both cases its value is definitely palliative and very rarely curative.—I am, etc.,

Bath, July 20. C. A. HUTCHINSON.

Colitis in Mental Hospitals

SIR,—Relating to the discussion on the surgery of the colon initiated by Mr. Eric Crook at the Royal Society of Medicine (*Journal*, May 29, p. 1129), may I add the following remarks? Forty years ago colitis used to be the scourge of the London workhouse infirmaries, whence the mental patients were sent to the London asylums, and in these institutions the disease often spread with many fatal cases. In my experience at the opening of the new and clean Claybury Asylum in 1893—the first asylum of the first London County Council—many hundreds of its insane population were received from the overcrowded Poor Law infirmaries, and some of these people were suffering from colitis with diarrhoea and the passing of blood and mucus. The disease often spread to others occupying beds adjoining them in the dormitories, so that its occurrence came to be regarded as a discredit, indeed as a disgrace, to the administration. In order to emphasize the reproach the term dysentery, implying infection and want of care, was applied to all cases of colitis, and every case had to be reported to the pathologist. The seriousness of colitis—now called dysentery—was shortly afterwards recognized by the Board of Control (Lunacy Commissioners), which instructed that every case of colitis (now asylum dysentery) occurring in the asylums of England and Wales (now mental hospitals) should be reported to the Board and described as dysentery.

In the London County Council report of the asylums committee for 1914 my personal experience at Claybury is recorded with that of others. Dysentery (colitis) then occurred in 125 males and 286 females in the asylums of London, which had a population of about 20,000 insane persons. The pathologist, Sir F. W. Mott, added, "The cases for the most part have occurred in groups of two or more in the same ward." In the report of the Board of Control for 1935, 450 fresh cases of dysentery are reported in the mental hospitals of England and Wales, and the incidence is quoted as 3.6 per 1,000 patients.—I am, etc.,

London, W.8, July 23. ROBERT ARMSTRONG-JONES, M.D., F.R.C.P.

Birth by the Rectum

SIR,—I was interested in Dr. J. B. Patel's report of a birth by the rectum (*Journal*, June 5, p. 1159), as I had a similar case in December, 1936.

A young unmarried Kikuyu woman was brought into the native hospital at Fort Hall. She had given birth to a still-born child through the rectum about three days previously and was complaining of constipation. On examination, the whole of the vulva and perineum were covered with keloid growths about the size of large acorns. This was the result of an old circumcision scar, it being the habit of the Kikuyu to circumcise their young women, often with a resultant traumatic atresia of the vaginal orifice, which necessitates operative intervention before they can deliver their first babies. The vaginal orifice was fibrosed and would only admit the second finger with difficulty. I discovered that the child had been delivered through the posterior vaginal wall and then through the anterior wall of the rectum. These had probably been torn, as a result of the force of the labour pains and of the child escaping along the line of least resistance. The perineum itself was intact. On arrival at the hospital the woman was already in a septic condition and died from puerperal sepsis three days later.

I was surprised that the perineum was not lacerated, although the sphincter ani was; but when the large size of the stools that these natives sometimes excrete on

defaecation are considered it can be understood why the perineum was not injured in this case.—I am, etc.,

P. G. PRESTON, M.B., Ch.B., M.C.O.G.

Kenya Colony, July 12.

Treatment of Retained Placenta

SIR,—I was much interested in Mr. David Currie's article in the issue of July 10 (p. 57), because for nearly twenty years I have injected the cord as a routine in all cases of uncomplicated delay in the third stage of labour. In fact so anxious have I been to avoid manual removal that in many cases injection has been repeated as many as three or four times over a period of hours, usually even then with success. Furthermore, in cases sent into hospital hours after delivery this procedure has almost invariably succeeded.

My technique is simpler than that which Mr. Currie describes largely because I have never tied the maternal end of the cord except, of course, in cases of multiple pregnancy. I gather from his paper that he always ties this end. I maintain that an "empty" placenta will come away with greater ease than one in which the cord is ligatured. Tying of it will cause it to be engorged and bulky. I entirely agree with Mr. Currie as to the probable mechanism of separation, etc., following injection, and therefore, since this is largely due to increased bulk after injection, why not start with as empty a placenta as possible and make the contrast as a result of filling it with fluid even greater? Further, a cord empty of blood is easier to inject as it contains practically no clots. Space will not permit me to go into my technique in detail, but I feel that for simplicity it can hardly be bettered.

Very briefly it is: leave the maternal end of the cord untied; freshen it by cutting off the terminal inch or so; use a rather fine-pointed glass Higginson's nozzle (with a Higginson's syringe) the end of which is slightly bulbous. This latter enables a ligature to be used to tie the cord over the nozzle. As a matter of fact this is seldom necessary as a firm grip with the gloved hand is all that is required to make a watertight "joint" between the cord and the nozzle.

I may add that during these twenty years manual removal has had to be performed by me on five occasions both in private and in hospital work. This figure does not, of course, include cases other than those at or near term.—I am, etc.,

J. R. CAMPBELL CANNEY.

Cambridge, July 19.

The London Fever Hospital

SIR,—Medical practitioners who know and use the London Fever Hospital will welcome a recent decision of the Committee of Management to extend the isolation accommodation.

A contract has been signed for the erection of a new three-storied building providing single rooms on two floors, with an operating theatre, and small wards for children above. The architects are Sir Aston Webb and Son, and the design carries out in their entirety the recommendations of the Medical Committee. There are balconies to all floors, running completely round the building, and all nursing and service will be from the open air without internal corridors of any sort. An appeal will be launched in the autumn, and we shall be grateful for all the help we can get. We hope, too, that all who are interested will see the new building in due course, and in the meantime we commend the service of this hospital to our colleagues in the Greater London area. Private rooms are available for paying patients, and a high standard of nursing and maintenance can be relied upon.

This was the first, and it remains the only, voluntary fever hospital. Its growth and endurance through 135 years of service and its importance in medical history give the hospital an honoured place in the voluntary system.—We are, etc.,

CHARLES R. BOX, M.D., F.R.C.P.
JOHN F. H. BROADBENT, M.D., F.R.C.P.
WILLIAM H. WILLCOX, M.D., F.R.C.P.
C. E. LAKIN, M.D., F.R.C.P.
C. W. GORDON BRYAN, F.R.C.S.
D. F. A. NEILSON, F.R.C.S.
THOMAS HUNT, D.M., F.R.C.P.
K. SHIRLEY SMITH, M.D., F.R.C.P.

Obituary

Dr. HORATIO E. RAWLINGS died at Bishopston, Gower, on July 15. The son of a Wesleyan Minister, he was born at Sunderland in 1859 and went to Swansea at an early age. He studied medicine at Queen's Hospital, Birmingham, and the London Hospital, and graduated L.R.C.P.I. in 1887 and M.R.C.S.Eng. in 1889. Following a period as house-surgeon at the Swansea General Hospital he began private practice in the town, but soon went to Reynoldston, Gower, where he worked for several years. In 1903 he returned to Swansea, and soon built up a large private and insurance practice; for many years he was medical officer to the Swansea Post Office. Dr. Rawlings was chairman of the Swansea Division of the British Medical Association in 1923–4. He took a keen interest in sport, and was medical officer to the Swansea Rugby team for a number of years. He was a clever and keen musician, and acted as organist and choirmaster to the Brunswick Church for a period of twenty-five years. He was conscientious, modest, and generous as a doctor, a true and devoted Christian, and in maintaining the highest traditions of a general medical practitioner endeared himself to his patients and to the general public of Swansea. He is survived by a widow and seven grown-up children.

We regret to announce that Dr. JOHN ANDREW CLARKE of Luton died in London on July 4 after an operation. The eldest of four sons, who all joined the medical profession, he was born in 1868 and studied at Queen's College, Galway, and Belfast, graduating B.A. of the Royal University of Ireland in 1906 and taking the M.B., B.Ch. and B.A.O. degrees in 1909. He began practice at Luton in 1922 and joined the Bedfordshire Branch of the British Medical Association, and was appointed medical officer to the East Ward, Luton, and public vaccinator for the East District. He had been a member of the Bedfordshire Panel Committee, and served on the committee of the Luton Medical Society. He leaves a widow, two sons, and two daughters; the elder son, Dr. J. R. G. Clarke, was in partnership with his father, and the younger son is a medical student at Oxford. Dr. J. A. Clarke's death from pulmonary embolism following an operation for acute appendicitis has come as a great shock to his many friends and colleagues in Luton and its neighbourhood.

The following well-known foreign medical men have recently died: Dr. FÉLIX DE LA LAPERSONNE, formerly professor of ophthalmology in the Paris faculty of medicine and president of the Académie de Médecine and of the International League for the Prophylaxis of Blindness; Professor MARIO CARRARA, successor to Professor C. Lombroso in the chair of criminal anthropology at Turin, and editor of the Italian Archives of Criminal Anthropology founded by Lombroso.

Universities and Colleges

UNIVERSITY OF OXFORD

H. M. Sinclair, B.Sc., B.M., M.A., has been elected to an official fellowship and tutorship in physiology at Magdalen College.

E. H. Leach, B.Sc., M.A., has been appointed to a lectureship in physiology at Brasenose College.

UNIVERSITY OF LONDON

At a meeting of the Senate held on July 21 the title of Professor of Morbid Anatomy in the University was conferred on G. R. Cameron, D.Sc., M.B., B.S.Melbourne, in respect of the post held by him at University College Hospital Medical School. The D.Sc. in Applied Physiology was conferred on G. P. Crowden, M.R.C.S., L.R.C.P., University Reader at the London School of Hygiene and Tropical Medicine.

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN BACTERIOLOGY.—H. Berry, C. T. Calam, S. P. Gupta, T. Richards, Phyllis M. Rountree, N. K. Sen.

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGY.—T. M. Anklesaria, Dorothy L. Burch, Carla B. Freeman, Margaret E. Gurney, Edna Howard, Christina M. Hueffer, Pamela Middleton, K. L. Parker, J. L. Peterson, Ethel M. Turner, Jean A. Wales, Z. Wonchockier, Lola M. Woods.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

The following scholarships, exhibitions, and prizes have been awarded at University College Hospital Medical School: *Goldsmid Entrance Scholarship*, R. E. O. Williams, Stella D. Morton. *Goldsmid Entrance Exhibition*, E. Petrie. *Atchison Scholarship*, L. J. Honeywill. *Atkinson Morley Scholarship* and *Magrath Scholarship*, A. S. Aldis. *Filliter Exhibition*, Isabel T. Hinde. *Fellowes Gold Medal*, A. M. Barry. *Fellowes Silver Medals*, P. H. Wood, D. A. Ferguson, Elizabeth Topley. *Liston Gold Medals*, *Alexander Bruce Gold Medal*, and *Tuke Silver Medal*, J. D. N. Nabarro. *Tuke Bronze Medal*, W. M. L. Turner. *Junior Clinical Surgery Prizes*, R. N. Houlding, M. F. Pilcher. *Ferriere Scholarship*, Ivy Tuck. *Bilton Pollard Fellowship*, M. Coleman, M.S., F.R.C.S.

LONDON HOSPITAL MEDICAL COLLEGE

The Price University Scholarship in the subjects of anatomy and physiology, value £100, open to students of the Universities of Oxford and Cambridge, has been awarded to P. W. Roe of Wadham College, Oxford.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN

The following awards of scholarships for 1937–8 are announced:

St. Dunstan's Exhibition: A. M. Dealler. *A. M. Bird Entrance Scholarship:* J. Myers. *Mabel Sharman Crawford Scholarship:* E. M. Robson. *Mrs. George M. Smith Scholarship:* V. J. McMullen. *MacIntyre Evans Scholarship:* L. M. Chant. *School Jubilee Bursary:* Mrs. E. Skelsey. Dr. *Margaret Todd Scholarship:* B. C. Mulvany. *Sarah Holborn Scholarship:* J. S. Davis. *A. M. Bird Scholarship for Clinical Studies:* B. J. H. Broadwood. *Alfred Langton Scholarship:* R. E. M. Bowden. *Ellen Walker Bursary:* M. Westmoreland-White. *Flora Murray Bursary:* E. Broadhead. *Beilby Bursary:* A. J. Blayn and E. A. Kaye. *Special Scholarships and Bursaries:* M. S. Cam, J. M. Drury-White, V. E. A. Sykes, M. L. Taylor, and M. V. Teichmann. *A. M. Bird Postgraduate Scholarship in Pathology:* M. Barber. *Mabel Webb and A. M. Bird Research Scholarship:* Marjorie V. N. Sudds, M.B., B.S., D.T.M. and H.

UNIVERSITY OF MANCHESTER

The Professor Tom Jones Memorial Surgical Fellowship has been awarded to T. S. B. Kelly, and Entrance Scholarships in Medicine to A. N. Guthkelch and L. Wise.

UNIVERSITY OF EDINBURGH

A graduation ceremony was held in M'Ewan Hall on July 21. The following degrees and diplomas were conferred:

HON. LL.D.—Edwin Bramwell, M.D., F.R.C.P., formerly Professor of Clinical Medicine and President of the Royal College of Physicians of Edinburgh.

M.D.—**W. M. Arnott, *F. Ayrey, J. C. Caird, *A. F. Cowan, R. W. Eason, **A. Haddow, **T. N. MacGregor, *H. M. D. Shepherd, J. K. Slater, I. D. Sutherland, **R. Walmsley, A. M. Watt.

M.B., CH.B.—J. Adelmann, G. O. Airey, L. Altman, J. P. Baird, H. A. Barker, Barbara U. Barnetson, M. R. J. Behrendt, H. J. Bell, D. K. Binder, Isabella R. Bishop, T. M'K. Boog-Scott, C. H. Bösenberg, S. O. Bramwell, T. J. Brownlee, K. I. Bruce, Jean M'K. Brunton, J. E. Buck, A. G. S. Calder, E. Campbell, D. L. Carmichael, C. Chesner, R. S. Churchward, G. J. Cleland, Joan K. Cunningham, Margaret H. Darling, †J. N. Davidson, S. Davison, B. Diamond, J. Dolgin, C. A. P. Donaldson, E. M. Donaldson, J. K. Drummond, D. E. Durran, Louise F. W. Eickhoff, †J. R. Frank, J. W. Fraser, Helen M. Gardner, S. Gellis, A. M. George, †A. D. Gillanders, R. O. Gillhespy, A. Graham, L. A. Griffith, C. Groves, J. Guthrie, R. H. Hannah, P. W. Hannay, E. I. B. Harvey, J. W. Heath, A. J. Hogan, R. W. B. Holland, G. Hollingsworth, J. Hotson, H. G. H. Houghton, Sir Eric O. A. Hutchison, J. E. Hutton-Mills, †J. Innes, J. C. J. Ives, W. O. James, †R. A. Jamieson, H. C. Jeffrey, R. W. P. Johnson, P. K. Kaufman, G. A. Kelsall, W. G. Kerr, H. M'P. Kilgour, F. Lake, F. W. Laurie, Deirdre M. Lewis, Elizabeth I. Low, R. B. Lucas M. Ludlam, Elizabeth M'Callum, Henrietta R. M'Cree, W. L. MacDonald, G. D. M'Dowall, A. A. MacGibbon, W. MacGregor, G. D. M'Intosh, R. A. M'Kail, J. M'Kee, A. M'Kelvie, D. H. MacKenzie, Agnes P. M'Laren, J. A. M'Laren, I. A. M. Macleod, W. Macleod, I. Macphail, D. A. Macpherson, R. L. Macpherson, Sheila M. L. M'William, V. S. Magnus, G. D. Malcolm, Joy I. G. Matson, H. J. S. Matthew, H. Meyer, J. Millar, J. H. Milligan, J. C. Milne, H. Milne-Redhead, A. Mondal, L. G. Morrison, A. J. G. Newton, W. Noordenbos, P. T. Northover, R. K. Oag, H. T. Osmond, M. W. Paterson, N. Pederson, D. B. Peterkin, G. J. Phillip, A. M. Phillips, L. Pollack, A. C. Reid, †F. H. Robarts, Ethel E. Robertson, R. P. Robertson, H. D. Rosenberg, W. Rosenbloom, D. C. Ross, G. I. M. Ross, J. M. H. Ross, J. M. Ross, R. M. Ross, A. P. Russell, K. D. Salzmann, D. L. Savill, G. W. Senter, A. C. Shrelford, J. W. Shield, G. F. F. Sinclair, R. S. Smail, A. G. Smith, R. B. Smith, A. St. G. Stephenson, P. D. Stewart, J. D. Sutherland, Rhoda M. Taylor, R. Troup, W. S. Tulloch, †Nina A. B. Verity, Doreen M. Waddington, G. C. Watt, C. C. Wedderburn, D. W. Whyte, A. W. Wilkinson, G. S. M. Wilson, G. Winchester, Leila E. Wynter, A. Young, R. G. B. Young.

DIPLOMA IN PUBLIC HEALTH.—P. G. Barrow, P. L. F. de Livera (*in absentia*), H. L. de Waal, A. M. Fraser, H. W. Hall, N. Husain (*in absentia*), P. L. Lai-Fook, E. A. Lawrence, V. P. M'Donagh, I. F. MacKenzie, V. D. Seevaretnam, S. Sivalingam, G. F. Valentine (*in absentia*), Agnes M. M. Hunter.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—K. B. Gore (*in absentia*), W. Happer, E. L. Lloyd, W. Mackie, N. S. Mohammed, W. Serle.

DIPLOMA IN PSYCHIATRY.—J. Carson, N. F. MacKenzie, J. H. Patterson.

DIPLOMA IN RADIOLOGY.—J. G. M'Whirter, J. R. Pierre (*in absentia*), T. Sprunt.

** Awarded Gold Medal for thesis. * Commended for thesis.
† Passed with honours.

The following prizes were presented: *Cameron Prize in Practical Therapeutics:* James Bertram Collip, M.D., F.R.S., Professor of Biochemistry in M'Gill University, Montreal. In recognition of his many contributions to endocrine therapy, and in particular his work on the parathyroid gland. *Ettles Scholarship and Leslie Gold Medal:* F. H. Robarts. *Scottish Association for Medical Education of Women Prize and Dorothy Gilfillan Memorial Prize:* Nina A. B. Verity. *Mouat Scholarship in the Practice of Physic, Annandale Gold Medal in Clinical Surgery, Wightman Prize in Clinical Medicine, and Murchison Scholarship in Clinical Medicine:* J. Innes. *Buchanan Scholarship in Midwifery and Gynaecology, and Beaney Prize in Anatomy and Surgery:* R. A. Jamieson. *James Scott Scholarship in Midwifery and Gynaecology:* J. R. Frank. *Conan Doyle Prize:* A. Stadion. *Royal Victoria Hospital Tuberculosis Trust Gold Medal:* Elizabeth M'Callum. *Murdoch Brown Silver Medal in Clinical Medicine:* J. P. Baird. *Pattison Prize in Clinical Surgery:* A. W. Wilkinson. *Goodsir Memorial Fellowship:* A. Brown. *Freeland Barbour Fellowship:* A. I. Pirie. *M'Cosh Bursary:* J. A. Farfor. *Gunning Victoria Jubilee Prize in Bacteriology:* S. Thomson. *Gunning Victoria Jubilee Prize in Pathology:* W. M. Arnott. *Gunning Victoria Jubilee Prize in Therapeutics:* H. Scarborough. *Gunning Victoria Jubilee Prize in Zoology:* C. A. Green and S. Thomson (jointly). *Lewis Cameron Postgraduate Prize:* C. A. Green. *Lewis Cameron Undergraduate Prize in Bacteriology:* K. A Bisset and M. Gardiner (equal). *Wellcome Gold Medal and Prize in the History of Medicine:* J. Waterston. *Cunningham Memorial Medal and Prize in Anatomy:* G. M. Wilson. *Whiteside Bruce Bursary:* J. R. Lauckner.

An address was delivered to the new graduates by the Promotor, Professor Sydney Smith, M.D., F.R.C.P.Ed.

NATIONAL UNIVERSITY OF IRELAND

At a meeting of the Senate on July 15, with the Chancellor, Mr. Eamon de Valéra, LL.D., President of the Executive Council of Saorstát Eireann, in the chair, Dr. Denis J. Coffey, Vice-Chancellor, presented a report on the summer session, 1937, of the General Medical Council, on which he is representative of the University.

UNIVERSITY COLLEGE, DUBLIN

At a meeting of Convocation on July 17 the following medical degrees and diplomas were conferred:

M.B., B.Ch., B.A.O.—D. P. Murnaghan, G. M. FitzGerald, Kathleen A. Roche, R. Belton, J. Clyne, Maria Dempsey, J. P. Dodd, A. Eustace, J. D. Ffrench, P. J. Gilroy, G. J. Glynn, T. J. Gorman, N. N. Holmes, B. F. J. Kean, P. J. McEnroy, E. McKiernan, W. McManus, Nora McNally, J. O'Connell, R. M. P. O'Dolan, D. G. O'Sullivan, G. A. Peltier, B. MacM. Ramsay, Bridget F. Staunton.

D.P.H.—J. McHugh, P. H. J. Clarke, W. O. Cremin, J. M. Murphy, G. Davis, C. B. Mallen, P. O'R. Gavin, W. J. O'Brien, Mary B. Brady, J. J. Campbell, P. J. Fox, J. T. Guinan, J. P. Maher, P. J. O'Doherty, E. O'Shaughnessy.

B.Sc. (PUBLIC HEALTH).—J. A. Craig, W. O. Cremin, P. O'R. Gavin, J. McHugh, C. B. Mallen, J. M. Murphy.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on July 22, with Mr. Henry Wade, President, in the chair, the following, having passed the requisite examinations, were admitted Fellows:

W. E. Austin, W. H. Bailey, D. Ballantine, E. E. Barnett, C. R. Chari, M. M. Cruickshank, R. H. Dale, W. K. House, J. Harkness, Agnes J. Herring, M. Jackson, K. G. W. James, H. I. Maister, A. R. A. Marshall, M. L. R. Morley, M. C. Moore, W. F. McGladdery, Margaret Fitz-H. Procter, J. C. Samis, G. I. Scott, I. H. Smith, S. L. Strange.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

A quarterly meeting of the Royal College of Physicians of Edinburgh was held on July 20, with the President, Dr. W. T. Ritchie, in the chair.

Dr. Francis Esmond Reynolds (Glasgow) and Dr. Charles Kelman Robertson (Edinburgh) were elected Fellows.

BRITISH POSTGRADUATE MEDICAL SCHOOL

The following constitute the Governing Body for the year 1937-8: Sir John Caulcutt (Chairman), Mr. Charles J. Allpass, Mr. W. Girling Ball, F.R.C.S., Sir Henry Brackenbury, LL.D., M.D., Viscount Dawson of Penn, M.D., P.R.C.P., Lieut.-Colonel H. R. Dutton, I.M.S. (ret.), Professor G. E. Gask, F.R.C.S., Dr. A. M. H. Gray, Mr. Somerville Hastings, F.R.C.S., Lord Horder, M.D., Mr. W. M. Goodenough, D.L., Miss L. Martindale, M.D., Sir Frederick Menzies, M.D., Sir Arthur S. MacNalty, M.D., Mr. H. J. Paterson, F.R.C.S., Sir Thomas Stanton, M.D., Sir Cuthbert Wallace, Bt., P.R.C.S., Sir William Willcox, M.D., Sir Alfred Webb-Johnson, F.R.C.S.; with Colonel A. H. Proctor, M.D., I.M.S. (ret.), as Dean and Secretary to the Governing Body.

COMBINED HOSPITALS UNIVERSITY ENTRANCE SCHOLARSHIPS

As a result of the examination held for the University Entrance Scholarships, offered by St. Bartholomew's Hospital Medical College, Guy's Hospital Medical School, and St. Thomas's Hospital Medical School, the following awards have been made:

H. V. Morgan (Gonville and Caius College, Cambridge), Scholarship at St. Bartholomew's Hospital; L. W. Smith (Sidney Sussex College, Cambridge), Exhibition at St. Bartholomew's Hospital.

G. E. H. Enderby (St. John's College, Cambridge), Scholarship at Guy's Hospital; G. T. G. Thomas (Gonville and Caius College, Cambridge), Exhibition at Guy's Hospital.

J. L. Pinniger (St. Edmund Hall, Oxford), Scholarship at St. Thomas's Hospital; M. G. Smith (Emmanuel College, Cambridge), Exhibition at St. Thomas's Hospital.

The Services

MEDICAL DIRECTOR-GENERAL, R.N.

Surgeon Vice-Admiral P. T. Nicholls, C.B., has been appointed Medical Director-General of the Royal Navy.

OPERATIONS IN PALESTINE

The names of Major H. Alcock, R.A.M.C., Group Captain K. Biggs, M.C., R.A.F.M.S., Wing Commander G. P. O'Connell, R.A.F.M.S., Squadron Leader G. E. Church, R.A.F.M.S., and Flight Lieutenant C. A. Rumball, R.A.F.M.S., have been brought to notice by the Air Officer formerly Commanding the British Forces in Palestine and Transjordan, in recognition of distinguished services rendered in connexion with the operations in Palestine during the period April to October, 1936.

Medical Notes in Parliament

The Summer Adjournment of Parliament is due to begin on July 30 and to end on October 21 unless the Speaker and the Lord Chancellor in the public interest call both Houses together at an earlier date. A new session is expected to be opened by the King on October 26.

The Collecting Charities (Regulation) Bill was read a first time in the House of Lords on July 22 on the motion of Lord Kennet, who, in introducing the Bill, explained it was to provide for the better regulation of collections for charitable, benevolent, or philanthropic purposes from house to house or in any place of entertainment or refreshment.

In the House of Lords, on July 26, the Finance Bill and the Milk (Amendment) Bill were read a second time. On the following day the Local Government Superannuation (Scotland) Bill was read a third time and passed.

Debates arranged in the House of Commons this week were concerned with the Mines Department, the co-ordination of defence, the cost of living, and Dominion affairs.

The Milk (Amendment) Bill passed through the report stage in the House of Commons on July 21 and was read a third time on July 23. On the latter day it was read a first time in the House of Lords.

The Royal Samaritan Hospital for Women Glasgow Order Confirmation Bill was considered by the Commons on July 21 and was read a third time on July 22, without amendment.

The Liverpool United Hospital Bill, as amended in committee, was considered on report in the House of Commons on July 22 and further amendments were made. The Bill was read a third time on July 26.

The Lords amendments to the Matrimonial Causes Bill were approved in the Commons on July 23. No allusion was made to lunacy as a ground for divorce. Also, on July 23, the Lords' amendments to the Cinematograph Films (Animals) Bill were accepted, and on July 26 the Lords' amendments to the Coal Mines (Employment of Boys) Bill were agreed to.

Pensions of Local Government Officers

In the House of Lords on July 19 the Local Government Superannuation Bill was considered in committee.

On Clause 5 (Power to admit employees of statutory undertakers and certain associations) Lord ADDISON moved to add a provision that where a local authority under Section 101 of the Local Government Act, 1929, made a grant to a voluntary organization for the provision of maternity and child welfare services, the provisions of Subsection (1) of Clause 5 should apply in relation to that organization and to health visitors and superintendents of welfare centres employed by those organizations as they applied in relation to statutory undertakers and to employees of those undertakers. Local authorities were empowered, when they came to an arrangement with voluntary organizations employing midwives, to arrange that the midwives so employed should be incorporated in the superannuation scheme as and when the local authorities took over the voluntary organizations. The discharge of duties under the Midwives Act was a statutory obligation on the local authorities, and the voluntary organizations in this case were performing these duties on behalf of the local authorities. The case was identical with that of officers employed in maternity and child welfare services. The officers in maternity and child welfare services employed by infant welfare associations were overlooked in the House of Commons, and it was to remedy that omission that he moved the amendment.

VISCOUNT GAGE asked Lord Addison not to press the amendment at this stage of the Bill. The clause as it stood was accepted by the Government as an amendment in the House of Commons. It related only to midwives employed by a voluntary organization with whom the authority responsible for midwifery services had made arrangements under the Midwives Act of last year. The duties imposed on the local authority, and consequently the services required of these midwives, were definite and specific; they were to be, so to speak, "on call," as and when required, to attend women needing the midwifery service for which the local authority was responsible. Their salaries were such as might be determined by the agreement and, in effect, the local authority indirectly paid those agreed salaries through the voluntary organization—an important point in the superannuation scheme. They were as nearly as might be in the same position as midwives directly employed by a local authority. The position of health visitors doing maternity and child welfare work was analogous, but not identical. The financial arrangements between the authority and the voluntary body were not the same. Services were not similarly specified, salaries were not specifically controlled, and subsidies were not so directly related to salaries. It was considerations of this kind which led the majority of the Selby-Bigge Committee to reject suggestions designed to secure the same object as this amendment. If an attempt were made to cover the case which Lord Addison cited, amendment of the Bill would logically have to be carried much further than he proposed. They could hardly differentiate between health visitors engaged on child welfare work and those similarly engaged on work in connexion with the blind, the tuberculous, and the mentally deficient as employees of voluntary bodies whose financial relations with local authorities were for the most part indistinguishable in principle from those of child welfare organizations. He did not wish Lord Addison and those for whom he spoke to regard this as necessarily the last word on the subject for all time. The Minister of Health had undertaken to explore the possibilities in another matter affecting the superannuation of nurses and health visitors. Consultation with the local authorities and others concerned might throw a different light on the considerations which, as at present envisaged, compelled him to ask that the amendment should not be pressed.

Lord ADDISON withdrew the amendment.

The Bill passed through committee.

The Bill passed through the report stage on July 22.

Marriage Bill

In the House of Lords, on July 19, Lord ELTISLEY moved the third reading of the Matrimonial Causes Bill. Lord DARYNGTON, in opposing the motion, said that it would be a very big step to make insanity a ground for divorce. Many of them had known of cases where men had returned to sanity after ten or even fifteen years.

The Bill was read the third time by 79 votes to 28, and passed. Among the Peers who voted for the third reading was Lord Dawson.

Animal Diseases and the Veterinary Service

During the debate on the second reading of the Agriculture Bill in the House of Lords on July 20 Lord ADDISON expressed the hope that some of the money voted to the eradication of disease would be devoted to research. With very inadequate finance an Agricultural Research Committee had been established on the lines of the Medical Research Committee. If, for a long time past, research into animal diseases had been organized and well directed, with pay such as would attract the right young men into it and would keep them in it, we should have been much further forward than now. He hoped that the expenditure under the Bill would not take the form of paying too much for animals found to be diseased, but would aim at seeking to remove the causes of disease, which could only be done by large-scale, patient encouragement of research.

Viscount BLEDISLOE hoped the time had come when the status of veterinary surgeons in this country would be improved. There were countries in which in some cases the medical and veterinary professions merged one into the other, as in Denmark, and in many countries there was not that disparity of status which unfortunately existed in this country and which kept some of the ablest and most scientifically minded men out of that branch of the medical profession.

The EARL OF GLASGOW said that in the more progressive counties in Scotland, where the local authorities had developed a co-ordinated medical, veterinary, and bacteriological service, they were concerned that the proposals of the Bill might seriously affect not only the veterinary services but the health services generally. In those health services the veterinary officer was only one link in the chain of control, the other links being the sanitary inspector and the county medical officer of health. Now it was proposed to break this chain, but, important as animal disease might be, public health was of more importance.

The House of Lords went into committee on July 22 on the Agriculture Bill. On Clause 18 Lord CRANWORTH moved to insert:

"The Chief Veterinary Officer of the Ministry of Agriculture shall supervise and direct such veterinary officers in the discharge of their duties and shall be responsible directly to the Minister in relation thereto."

The EARL OF FEVERSHAM said the matter had already been discussed in the House of Commons. Reference had been made to the practice followed in the Ministry of Health, but there was no statutory provision that compelled the Minister of Health to appoint a chief medical officer or said that the chief medical officer was to have direct access to the Minister. This was done in accordance with administrative convenience and at the wish of the Minister himself. It was the permanent secretary who was responsible for the efficient administration of the Department and who in turn was responsible to the Minister. It would be contrary to precedent for the chief veterinary officer of the Ministry of Agriculture to be responsible for other than his own veterinary work and that of the staff under him. There was no doubt that whenever representation to the Minister was necessary the chief veterinary officer would have access to him at any time to raise a point for which he was responsible.

The amendment was withdrawn.

On Clause 32 (Application to Scotland) Lord ROWALLAN moved to add a new paragraph to provide that the functions of the local authorities under the Diseases of Animals Act, 1894–1935, should be transferred to the Minister. He said that under the Bill three duties of local authorities under the Diseases of Animals Act would be transferred to the central veterinary service. These were routine veterinary inspection of dairy herds under the Milk and Dairies Legislation, tuberculin testing at veterinary inspection under the Milk (Special Designations) Order of the Department of Health for Scotland, and diagnostic inquiries into the various scheduled diseases, including tuberculosis.

Lord FEVERSHAM said it would cut right across the intentions of the central veterinary service if it were contemplated that the numerous activities of local authorities under the Diseases of Animals Act were to be effected by the central service. Grave difficulties would arise in administration of what was to be a service directed essentially to the better eradication of animal diseases.

The amendment was withdrawn.

The EARL OF GLASGOW moved to insert in Clause 32 (Application to Scotland) the following new paragraph:

It shall be the duty of officers appointed by the Minister to furnish any information reasonably required by the local authority or its medical officer of health in regard to any disease of animals affecting or likely to affect the health of persons resident in the area of the authority, and to trace the course of infection wherever reasonably practicable.

Lord STRATHCONA said it was recognized that the services of a veterinary inspector were and would still be required at times by local authorities to enable them to discharge their

functions in relation to public health. Provision was made in Clause 18 requiring the Minister to make arrangements for placing the services of veterinary inspectors at the disposal of local authorities. The services of veterinary inspectors would be made available for inspections of cattle carried out in consequence of notifications received from medical officers of health under the Milk and Dairies Acts or the Infectious Disease (Prevention) Act, 1890, that consumption of milk from a certain specified herd was likely to cause tuberculosis or was suspected to have caused some other infectious disease.

The EARL OF FEVERSHAM said that where a medical officer had been informed of a case of tuberculosis of bovine origin the inspectors, whether full-time or part-time, under the veterinary service would act in the closest co-operation with the medical officer in tracking the herd from which the disease arose. He hoped that practice would be followed a great deal more than it had been in the past. It not only benefited the large centres of population but the agricultural industry. It would be a means whereby the veterinary service could trace the disease which it wished to eradicate. He could give the most explicit assurance that this would be carried out.

The amendment was withdrawn.

Consideration of the Bill in committee was then concluded.

Factories Bill

The report stage of the Factories Bill was taken in the House of Lords on July 22. On Clause 2 (Overcrowding) the House agreed to an amendment moved by the EARL OF MUNSTER authorizing the chief inspector by certificates to exempt any workroom in which explosive materials are manufactured or handled from provisions laid down in the clause.

On Clause 42 (Washing facilities) an amendment was accepted on the motion of the EARL OF MUNSTER to provide that the facilities for washing "shall include soap and clean towels or other suitable means of cleaning or drying." The Earl of Munster also moved to insert a subsection providing that the Home Secretary might by regulation exempt factories from any of the requirements of the clause in cases of difficulty in obtaining an adequate supply of water or where accommodation was restricted but adequate and suitable washing facilities were otherwise conveniently available. The proviso was accepted.

On Clause 43 (Accommodation for clothing) an amendment was accepted allowing the Home Secretary to exempt factories from any of the requirements of the clause in special circumstances specified in the Regulations.

Lord FARINGDON moved to provide on Clause 53 (Underground rooms) that no underground workroom should be excepted from the clause unless certified by the inspector for the district to be suitable for the purpose on hygienic grounds, and in particular as regards construction, light, ventilation, and adequate means of escape in case of fire. The EARL OF MUNSTER said the clause as it stood would be more effective in securing improvement in underground rooms. The issue of positive certificates by inspectors tended to tie the hands of the staff in future in raising standards. The amendment was negatived.

After Clause 54 (Basement bakehouses) Lord FARINGDON moved to insert a new clause prohibiting baking between 11 p.m. and 5 a.m. except as allowed by special order of the Home Secretary. The EARL OF MUNSTER said the report of the Committee on Night Baking had been very recently received and demanded a more thorough examination than had so far been possible. It would not be possible for the Government to entertain any question of legislation on the subject during the present session. The Minister of Labour was willing to enter into negotiations with representatives of the two sides without delay to establish some joint machinery whereby the trade might devise means for ameliorating conditions.

The amendment was negatived.

On Clause 73 (Reduction of weekly hours of work of young persons under 16) Viscount SAMUEL moved to provide that after three years from the commencement of the Act the maximum weekly hours for young persons under 16 should be reduced to 40, while 44 should be the maximum in lieu of 48 in the exempted trade. The EARL OF MUNSTER said it would be impossible to go further at the present time than the proposals in the Bill, but the Government expected at no distant date to make a further advance. The proper way to deal with the matter was to consider it in the light of the experience which would be gained during the next few years when industry had adjusted itself to the reduced hours laid down in the Bill.

Lord Samuel's amendment was defeated by 50 to 14.

On Clause 101 (Certificate of fitness for employment of young persons) an amendment was accepted on the motion of the EARL OF MUNSTER to insert the following new subsections:

"Where the examining surgeon so directs in the certificate, any such condition as aforesaid shall, so far as relates to the employment in respect of which the certificate was issued or other employment in a factory in the occupation of the same occupier, continue to have effect when the young person has attained the age of 16; but unless such a direction is made the condition shall cease to have effect when the young person attains the age of 16, and shall in any case cease to have effect when the young person attains the age of 18.

"Where a certificate under this section is subject to a condition requiring re-examination after an interval specified in the certificate, the examining surgeon on such re-examination may vary the certificate or may revoke the certificate as from such date as he may direct; and if the certificate of a young person is revoked before he attains the age of 16 he shall not remain in any employment to which the certificate relates, and subsection (1) of this section shall thereafter have effect as if no certificate had been issued in respect of that young person."

The amendment was agreed to.

A new clause was added dealing with the application of the Act to electrical stations, including the application of the provisions of Part IV with respect to special regulations for safety and health.

The report stage was completed.

The House of Lords read the Factories Bill a third time on July 23.

"Deplorable" Housing Conditions in Carmarthen

Mr. JAMES GRIFFITHS inquired on July 22 whether the attention of the Minister of Health had been called to the report made by the medical officer of health for the county of Carmarthen, drawing attention to the urgent need for a maternity home in the county, and to the deplorable housing conditions in some parts, in particular to a case in which a midwife had reported that she had been compelled to use a step-ladder to reach a patient in one house; and whether, having regard to the high incidence of maternal mortality and of tuberculosis in the county, he would cause an inquiry to be made into the housing conditions there. Sir KINGSLEY WOOD replied that his attention had not been drawn to the report. Provision of a maternity home was being actively considered by the Carmarthen County Council in conjunction with the Llanelly Town Council. He was aware of the housing conditions in the county, and was arranging for his officers to confer in the matter with the local authorities concerned.

Rehabilitation After Accidents

Sir ARNOLD WILSON, on July 26, asked the Minister of Health what, if any, steps he had in contemplation to give effect to the recommendation of the interdepartmental committee on the rehabilitation of persons injured by accidents, with particular reference to the treatment of the 200,000 cases of fractures which occurred annually. Mr. BERNAYS replied that the Minister had already sent copies of the interim report of this committee to the county and county borough councils in England and Wales, with a covering circular. In this report the committee expressed the hope that they would be in a position to present a further report without delay, and the Minister did not propose to take any further general action on this subject until he had received that report.

Report of Committee on Night Baking.—Replying, on July 22, to an inquiry by Mr. Banfield about the report of the Committee on Night Baking, Sir SAMUEL HOARE said the committee, by a majority, advised against statutory prohibition of night baking. Its view was that such prohibition would fall far short of providing comprehensive and effective relief to the night baker from the serious social disadvantages under which he laboured. The situation presented in the report demanded a more thorough examination than had been possible, and he could not at present make any final announcement of the Government's views on the main issue. In view of the nature of the report it would not in any case be possible for the Government to entertain any question of legislation on the subject during the present session. The committee had suggested that some recognized body should be set up on which representatives of both sides of the trade might meet together to thrash out difficulties and devise means for amelioration of conditions. The Government was prepared to take action to give effect to this.

Industrial Accidents Increase.—Answering Mr. Alfred Short on July 22, Sir SAMUEL HOARE said he much regretted the increase in industrial accidents during 1936 as compared with 1935. As the Chief Inspector pointed out in the introduction to his report, the increase in the number of accidents was partly due to increased employment. Statistics over a period of years showed that the rate of accidents in proportion to the number of persons in employment was decreasing. If any large reduction of accidents was to be obtained it must be through the exercise of increased care by both employers and workpeople. This could best be secured through the development of safety organizations. The Factory Department had made every effort in the past to promote such development, and would continue to do so.

Compulsory Pasteurization.—Mr. WM. LEACH asked the Minister of Health on July 22 to have a searching inquiry made into the allegations against raw milk, "in view of the many loopholes in the evidence adduced in support of the allegations against raw milk in connexion with outbreaks of scarlet fever and typhoid fever," before he sanctioned any general claim for the compulsory pasteurization of milk. Sir KINGSLEY WOOD replied that he was satisfied that in all recent cases of this kind which had been investigated by his department, and in which the outbreak was traced to the consumption of raw milk, the evidence on this point was conclusive. He recalled that the Cattle Diseases Committee of the Economic Advisory Council, which reported in 1934, reviewed the question of the danger of the spread of these diseases through the medium of milk before it recommended compulsory pasteurization in large towns. He did not consider it necessary to institute any further inquiry into this question.

The Paratyphoid Outbreak in Liverpool.—Asked on July 22 what was the cause of the Liverpool outbreak of paratyphoid fever in January last, Sir KINGSLEY WOOD said the medical officer of health of the city was of opinion that the outbreak was probably caused by the infection of food by a carrier of the disease.

Tuberculosis Statistics.—Sir KINGSLEY WOOD furnished on July 22 the following statistics on the incidence and mortality:

Tuberculosis (All Forms)

	Cases	Deaths
Norway (1934)	5,521	3,225
Japan (1934)	*	131,525
Germany (1934)	*	47,179
Switzerland (1935)	*	4,035
England and Wales (1935)..	59,623	29,201

*Information not available.

Notes in Brief

During 1936 six persons under 16 years of age were killed and 1,188 injured (disabled for more than three days) at mines under the Coal Mines Act in Yorkshire.

Mr. Chamberlain told Mr. B. V. Kirby, on July 14, that he could hold out no hopes of special facilities being given for the passage of the Local Authorities (Hours of Employment in Connexion with Hospitals and Institutions) Bill.

Medical News

The House of the British Medical Association, including the Library, will be closed from 6 p.m. on Friday, July 30, to 9 a.m. on Tuesday, August 3 (Library 10 a.m.).

The Royal College of Physicians of London will be closed from Monday, August 2, to Saturday, September 11, both days inclusive.

In our advertisement columns this week there appears a vacancy for the University Chair of Pharmacology, tenable at the College of the Pharmaceutical Society of Great Britain, at a salary of £1,200 per annum.

The sixteenth Carlsbad international postgraduate course, with special reference to balneology and balneotherapy, will be held at Carlsbad from September 12 to 18. Further information can be obtained from Dr. Edgar Ganz, Carlsbad.

The twenty-first International Congress against Alcoholism will be held at Warsaw from September 12 to 17 at the University Józef Pilsudski. Among the subjects to be discussed are alcohol and work; the campaign in Poland against alcoholism; the action of alcohol on the brain, and beer as the cause of psychoses; racial, environmental, and age factors; the work carried on in Germany, the Ukraine, and the United States; fiscal considerations and sociological difficulties; and the possibilities of international collaboration. The preliminary programme can now be obtained from the general secretariat of the congress, 24, Chocimska Street, Warsaw.

The Minister of Health has sanctioned the borrowing of £488,666 by the Lancashire Mental Hospitals Board for works in connexion with the extension of the Brookhall certified institution for mental defectives, to provide accommodation for 1,326 additional patients, bringing the total accommodation of the institution up to 2,098. The new accommodation will include a hospital, school, workrooms, recreation hall, staff cottages, and administrative buildings.

Lord Nuffield and Mr. Edward Meyerstein have been made vice-presidents of Papworth Village Tuberculosis Settlement. In 1937 Lord Nuffield has given £25,000 to the settlement, and Mr. Meyerstein £20,000.

Miss Hurdon, M.D., C.M., retires from the directorship of the Marie Curie Hospital, Fitzjohn's Avenue, N.W., at the end of this year. Dr. M. D. Gilmour has been appointed to succeed Miss Hurdon as director from January 1, 1938.

Dr. Leslie Winter Dryland and Lieut.-Colonel Josiah Walker, M.C., T.D., have been appointed Deputy Lieutenants for the County of Northampton.

Dr. William J. Kerr of San Francisco was elected president of the American College of Physicians at the annual meeting recently held at St. Louis.

Sir Herbert Samuelson, acting on medical advice, has resigned the office of Chairman and Treasurer of University College Hospital, which he has held since 1927. Sir Courtauld Thomson will hold these offices pending the appointment of a successor.

The issue of *Il Policlinico* (Sez. Prat.) for July 12 contains a sympathetic obituary notice of Sir Squire Sprigge, late Editor of the *Lancet*.

The June issue of *Norsk Magazin for Laegevidenskapen*, the organ of the Norwegian Medical Association in Oslo, is dedicated to Francis Harbitz, professor of morbid anatomy and forensic medicine, on the occasion of his seventieth birthday, and contains a bibliography of his writings from 1895 to 1937.

The Air Ministry has notified aircraft owners that it intends to make the carrying of oxygen compulsory during flights by commercial aircraft at altitudes of 15,000 feet.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Successive Miscarriages

Dr. O. SYDENHAM writes: I should be very glad if any of your readers could suggest treatment for a patient who has had five successive miscarriages at ages varying from nine weeks to four months. There is no physical abnormality, and her Wassermann reaction and the husband's are negative.

Weight of Twins

Dr. H. J. CLUTTERBUCK (Llanelly) writes: I have to-day delivered a multipara of twin girls, both being breech presentations. The first child weighed 9½ lb. and the second one 8½ lb. In my fairly long experience of midwifery I have never seen such splendid specimens, and I should like to know what is the record weight for twins born alive.

Agranulocytosis and Rheumatism

Dr. C. J. YOUNG (Bradford) writes: With reference to the question asked by Mr. L. A. Riddell (*Journal*, July 24, p. 197), the possibility implied was considered, but rheumatic fever has not so far been incriminated as a cause of agranulocytosis.

LETTERS, NOTES, ETC.

Medical Books for a Mission Hospital

Dr. HOPE TRANT (Mwenzo Hospital, P.O. Isoka, Northern Rhodesia) writes: I ask leave to use your columns to beg for discarded medical books for this mission hospital. There are probably among your readers practitioners who take a pride in keeping their medical libraries up to date, or who, for various reasons, must keep abreast of the latest developments. May I ask these, when they are replacing their older editions with newer ones, to be so kind as to put aside the older ones for us. The Livingstonia Mission, to which this hospital belongs, has a chain of native hospitals in Northern Rhodesia and Nyasaland. They are run on pitifully small grants ranging from £40 to £200 per annum, and, as the medical missionaries' salaries are also very small, there is little or no money for the purchase of new medical books. On isolated stations medical works are our consultants and guides, and if these are antiquated and out of date, so will our practice become. If, therefore, any of your readers would be kind enough to send us, by book post to the above address, medical books of any kind, but preferably not older than 1926, they would earn our heartfelt thanks. Should duplicates be received, they will be passed on to another station.

Education for Nursing

At the opening meeting of the International Council of Nurses Quadrennial Congress Mr. Kenneth Lindsay, M.P., Parliamentary Secretary to the Board of Education, said that the Board was doubly interested in the nursing profession. In the first place, the local education authorities throughout England and Wales employed a nursing staff equivalent to 2,574 whole-time nurses, who assisted the medical officers at school inspections and worked in the school clinics, and also followed up the work in the schools by visits to the children's homes and by interviews with their parents. The Board was naturally concerned with the education of so large a number of women in the employment of the authorities, and too much thought could not be given to providing the training which would best fit them for the special duties required in the school medical service. In the second place, the Department was interested in the education of nurses because it was anxious that the schools should help the nursing profession as far as possible by supplying the kind of girls that were needed.

Bonomo and the Itch-mite

Dr. CONOR J. O'L. MAGUIRE (Co. Mayo) writes: Reading your annotation on "Bonomo and the Itch-mite" (*Journal*, July 17, p. 124) suggests that it may be of interest to know that the parasitic origin of scabies was well known in the west of Ireland, and that the knowledge must have dated very far back. I remember when a boy seeing women searching the hands of children who had scabies with a fine sewing needle and picking out the mite (or, as they called it, the fleshworm) on the point of the needle. These women were illiterate Irish-speaking people, to whom the knowledge must have been handed down through generations. There is an old Irish proverb relating to the itch-mite which is called *Frigh*: "Is lugha na frigh ughdhar an droch-adhbar"; which is translated: "Smaller than the itch-mite is the beginning of evil" (or malignant disease).

Thinking and Trying

In the "Nova et Vetera" article on page 120 of our issue for July 17 it was stated that Sir David Wilkie, in his address on "The Scottish Tradition in Surgery," connected John Hunter's advice, "Don't think; try it," with immunization of human beings by giving them cow-pox. Professor J. A. Nixon, however, with a desire to put the story in its right setting, informs us that Baron gives the whole letter in his *Life of Edward Jenner* (vol. 1, p. 33), showing that Hunter was referring to some observations on hedgehogs. The letter runs:

> "I thank you for your experiment on the hedgehog: but why do you ask me a question by the way of solving it? I think your solution is just, but why think,—why not try the experiment? Repeat all the experiments upon a hedgehog as soon as you receive this, and they will give you the solution."

Cheap Milk for Mothers and Children

A leading article in the *Journal* of July 17 discussed the memorandum on cheap milk for mothers and children issued by the Children's Minimum Council. The Secretary now informs us that there has been such a demand for this memorandum that the Council has decided to publish it in pamphlet form, and it will be on sale at the office, 72, Horseferry Road, S.W.1 (price 6d. a copy).

Bermondsey Public Solarium

The laying of the foundation stone of the Bermondsey Public Health Centre was reported in the *British Medical Journal* of September 28, 1935, and the Centre was officially opened by the mayor on November 7, 1936. We have now received a thirty-two-page booklet describing the new light treatment department, or solarium, which occupies almost the entire first floor of the Public Health Centre. A light treatment department was first introduced in Bermondsey in 1926, when the capacity of the department was 350 per day. Now it is 1,600, and up to fifty patients can receive treatment simultaneously with the present apparatus. The booklet is issued by Hanovia Ltd. of Slough, who designed and installed the equipment for the new department.

Dr. H. V. CRABTREE (Torquay) wishes to announce that he is no longer associated in partnership with the Southern Medical Agency, and that in consequence of his withdrawal all correspondence for that agency should be addressed to 1, Albert Street, Birmingham.